

# Part III

## Environmental Data and Trends

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# Population

## Population

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**Table 1.1 U.S. Population and Population Growth Rate, 1900-1997**

Year	Popu- lation	Growth rate	Year	Popu- lation	Growth rate	Year	Popu- lation	Growth rate
	millions	%		millions	%		millions	%
1900	76.09	na	1933	125.58	0.59	1966	196.56	1.16
1901	77.58	1.94	1934	126.37	0.63	1967	198.71	1.09
1902	79.16	2.01	1935	127.25	0.69	1968	200.71	1.00
1903	80.63	1.84	1936	128.05	0.63	1969	202.68	0.98
1904	82.17	1.88	1937	128.82	0.60	1970	205.05	1.17
1905	83.82	2.00	1938	129.82	0.77	1971	207.66	1.26
1906	85.45	1.92	1939	130.88	0.81	1972	209.90	1.07
1907	87.01	1.81	1940	132.12	0.95	1973	211.91	0.95
1908	88.71	1.94	1941	133.40	0.96	1974	213.85	0.91
1909	90.49	1.99	1942	134.86	1.09	1975	215.97	0.99
1910	92.41	2.10	1943	136.74	1.38	1976	218.04	0.95
1911	93.86	1.56	1944	138.40	1.21	1977	220.24	1.01
1912	95.34	1.56	1945	139.93	1.10	1978	222.58	1.06
1913	97.23	1.96	1946	141.39	1.04	1979	225.06	1.10
1914	99.11	1.92	1947	144.13	1.92	1980	227.22	0.96
1915	100.55	1.44	1948	146.63	1.72	1981	229.47	0.98
1916	101.96	1.40	1949	149.19	1.73	1982	231.66	0.95
1917	103.27	1.27	1950	152.27	2.05	1983	233.79	0.91
1918	103.21	-0.06	1951	154.88	1.70	1984	235.82	0.87
1919	104.51	1.26	1952	157.55	1.71	1985	237.92	0.89
1920	106.46	1.85	1953	160.18	1.66	1986	240.13	0.92
1921	108.54	1.93	1954	163.03	1.76	1987	242.29	0.89
1922	110.05	1.38	1955	165.93	1.77	1988	244.50	0.91
1923	111.95	1.71	1956	168.90	1.78	1989	246.82	0.94
1924	114.11	1.91	1957	171.98	1.81	1990	249.44	1.06
1925	115.83	1.50	1958	174.88	1.67	1991	252.12	1.07
1926	117.40	1.34	1959	177.83	1.67	1992	255.00	1.13
1927	119.04	1.39	1960	180.67	1.59	1993	257.75	1.07
1928	120.51	1.23	1961	183.69	1.66	1994	260.29	0.98
1929	121.77	1.04	1962	186.54	1.54	1995	262.76	0.94
1930	123.08	1.07	1963	189.24	1.44	1996	265.18	0.92
1931	124.04	0.78	1964	191.89	1.39	1997	267.64	0.92
1932	124.84	0.64	1965	194.30	1.25			

**Source:** U.S. Department of Commerce, Bureau of the Census, *Historical National Population Estimates: July 1, 1900 to July 1, 1997* (an Internet accessible data file, release date: April 2, 1998) based on Current Population Reports, Series P-25, Nos. 311, 917, and 1095, and Population Paper Listing PPL-91 R (DOC, Census, Washington, DC, 1998).

**Notes:** Annual population estimates are for July 1 of each year. National population estimates for the years 1940-1979 cover the resident population plus armed forces overseas. National population estimates for all other years only cover the resident population. All years 1900-1949 exclude the population residing in Alaska and Hawaii. Growth rate refers to average annual change in population, in percent.

**Table 1.2 Components of U.S. Population Change, 1940-1997**

Year	Births	Deaths	Net civilian immigration	Net change
..... <i>millions</i> .....				
1940	2.570	1.432	0.077	1.221
1945	2.873	1.549	0.162	1.462
1950	3.645	1.468	0.299	2.486
1955	4.128	1.537	0.337	2.925
1960	4.307	1.708	0.328	2.901
1965	3.801	1.830	0.373	2.315
1970	3.739	1.927	0.438	2.617
1975	3.144	1.894	0.449	2.165
1980	3.612	1.990	0.845	2.510
1985	3.761	2.086	0.649	2.171
1990	4.148	2.155	0.539	2.532
1997	3.899	2.333	0.868	2.435

**Sources:** U.S. Department of Commerce, Bureau of the Census, *U.S. Population Estimates, by Age, Sex, Race, and Hispanic Origin*, Current Population Reports, Series P-25, No. 1045 (1990) and No. 1095 (1993) (GPO, Washington, DC), and Population Paper Listings, PPL-91 R (DOC, Census, Washington, DC, 1998), and earlier census reports.

**Note:** Annual population estimates are for July 1 of each year.

**Table 1.3 Age Structure of the U.S. Population, including Armed Forces Overseas, 1940-1997**

Year	< 5	5-14	15-24	Age classes, in years				
				25-34	35-44	45-54	55-64	> 64
..... <i>millions</i> .....								
1940	10.6	22.4	24.0	21.5	18.4	15.6	10.7	9.0
1950	16.2	24.3	22.1	23.8	21.5	17.3	13.3	12.3
1960	20.3	35.7	24.6	22.9	24.2	20.6	15.6	16.7
1970	17.2	40.7	36.5	25.3	23.1	23.3	18.7	20.0
1980	16.4	34.9	42.8	37.3	25.7	22.8	21.7	25.6
1985	18.0	33.9	39.8	41.6	31.8	22.6	22.3	28.5
1990	18.9	35.2	37.1	43.4	37.9	25.2	21.1	31.2
1997	19.2	38.8	36.7	39.7	44.1	33.6	21.8	34.1

**Sources:** U.S. Department of Commerce, Bureau of the Census, *Historical Statistics of the United States: Colonial Times to 1970*, Part I, Series A 30-37 (GPO, Washington, DC, 1975).

--, *U.S. Population Estimates, by Age, Sex, Race, and Hispanic Origin*, Current Population Reports, Series P-25, No. 1045 (1990) and No. 1095 (1993) (GPO, Washington, DC), and Population Paper Listing PPL-91 R (DOC, Census, Washington, DC, 1998).

**Note:** Annual population estimates are for July 1 of each year.

## Population

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**Table 1.4 U.S. Population in Urban, Suburban, and Rural Areas, 1950-1996**

Year	Urban population		Suburban population		Rural population	
	millions	%	millions	%	millions	%
1950	49,412	32.8	35,087	23.3	66,197	43.9
1960	58,004	32.3	54,881	30.6	66,438	37.0
1970	63,797	31.4	75,622	37.2	63,793	31.4
1980	67,949	30.0	101,481	44.8	57,115	25.2
1990	77,243	31.1	115,483	46.4	55,984	22.5
1996	80,445	30.3	131,340	49.5	53,498	20.2

**Source:** U.S. Department of Commerce, Bureau of the Census, Census of Population and Housing, 1950, 1960, 1970, 1980, and 1990, Number of Inhabitants, U.S. Summary (GPO, Washington, DC) and updates by agency.

**Notes:** Urban refers to population inside central cities of metropolitan areas (MAs). Suburban refers to MA population in suburbs outside central cities. Rural refers to nonmetropolitan population. MAs are defined for each population census.

**Table 1.5 U.S. Population by Region, 1900-1997**

Year	Northeast	Midwest	South	West
	.....	regional population, in millions	.....	.....
1900	21,047	26,333	24,524	4,309
1910	25,869	29,889	29,389	7,082
1920	29,662	34,020	33,126	9,214
1930	34,427	38,594	37,858	12,324
1940	35,977	40,143	41,666	4,379
1950	39,478	44,461	47,197	20,190
1960	44,678	51,619	54,973	28,053
1970	49,061	56,590	62,813	34,838
1980	49,137	58,867	75,367	43,171
1990	50,809	59,669	85,446	52,786
1997	51,588	62,461	94,187	59,400

**Sources:** U.S. Department of Commerce, Bureau of the Census, *1990 Census of Population and Housing*, CPH-2-1 (GPO, Washington, DC, 1993).

--, *Estimates of the Population of States: Annual Time Series July 1, 1990 to July 1, 1997* (an Internet accessible data file; release date: January 8, 1998). Data are consistent with data in Press Release CB97-213, December 31, 1997.

## Population

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**Table 1.6 U.S. Population Density, 1960-1997**

Year	Total United States	Counties in coastal regions				Interior of U.S.
		Pacific	Gulf of Mexico	Atlantic	Great Lakes	
<i>Land area, in thousands of square miles</i>						
1994	3,536.3	509.9	114.5	147.8	115.4	2,648.7
<i>Population, in millions</i>						
1960	179.3	17.9	8.4	44.5	23.7	84.8
1970	203.3	22.8	10.0	51.1	26.0	93.3
1980	226.5	27.0	13.1	53.7	26.0	106.7
1990	248.7	33.2	15.2	59.0	25.9	115.3
1995	262.8	35.2	16.5	61.0	26.5	123.5
1997	267.6	36.0	16.9	61.7	26.6	126.3
<i>Population per square mile</i>						
1960	50.7	35.1	73.4	301.1	205.4	32.0
1970	57.5	44.7	87.3	345.7	225.3	35.2
1980	64.0	53.0	114.4	363.3	225.3	40.3
1990	70.3	65.1	132.8	399.2	224.4	43.5
1995	74.3	69.0	144.1	412.7	229.6	46.6
1997	76.7	70.6	147.6	417.5	230.5	47.7

**Source:** U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States, 1996* (GPO, Washington, DC, 1996).

--. *Statistical Abstract of the United States, 1998* (GPO, Washington, DC, 1998).

**Notes:** Coastal area includes 672 counties and independent cities with at least 15 percent of their land area either in a coastal watershed or in a coastal cataloging unit defined in 1992 by the National Oceanic and Atmospheric Administration.

## Population

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**Table 1.7 U.S. Population Below Poverty Level by Race, Residence, and Region, 1969-1997**

Year	Total		Race			Residence			Region			
	Num- ber millions	Rate %	African American	His- panic origin	MA urban	MA suburb	MA Rural	North- east	Mid- west	South	West	
			White				millions					
1969	24.15	12.1	16.66	7.10	na	7.99	5.09	11.06	4.11	5.42	11.09	3.53
1970	25.42	12.6	17.48	7.55	na	8.12	5.20	12.10	na	na	11.48	na
1971	25.56	12.5	17.78	7.40	na	8.91	5.65	11.00	4.51	5.76	11.18	4.10
1972	24.46	11.9	16.20	7.71	na	9.18	5.33	9.95	4.27	5.26	10.93	4.01
1973	22.97	11.1	15.14	7.39	2.37	8.59	5.17	9.21	4.21	4.86	10.06	3.84
1974	23.37	11.2	15.74	7.18	2.58	8.37	5.48	9.52	4.47	4.99	10.76	4.04
1975	35.88	12.3	17.77	7.55	2.99	9.09	6.26	10.53	4.90	5.46	11.06	4.45
1976	24.98	11.8	16.71	7.60	2.78	9.48	5.75	9.75	4.95	5.66	10.35	4.02
1977	24.72	11.6	16.42	7.73	2.70	9.20	5.66	9.86	4.96	5.59	10.25	3.93
1978	24.50	11.4	16.26	7.63	2.61	9.29	5.81	9.41	5.05	5.19	10.26	4.00
1979	26.07	11.7	17.21	8.05	2.92	9.72	6.42	9.94	5.03	5.59	10.63	4.10
1980	29.27	13.0	19.70	8.58	3.49	10.64	7.38	11.25	5.37	6.59	12.36	4.96
1981	31.82	14.0	21.55	9.17	3.71	11.23	8.12	12.48	5.82	7.14	13.26	5.61
1982	34.40	15.0	23.52	9.70	4.30	12.70	8.55	13.15	6.36	7.77	13.97	6.30
1983	35.30	15.2	23.98	9.88	4.63	12.87	8.88	13.52	6.56	8.54	13.48	6.68
1984	33.70	14.4	22.96	9.49	4.81	na	na	na	6.53	8.30	12.79	6.07
1985	33.06	14.0	22.86	8.93	5.24	14.18	9.10	9.79	5.75	8.19	12.92	6.20
1986	32.37	13.6	22.18	8.98	5.12	13.30	9.36	9.71	5.21	7.64	13.11	6.41
1987	32.22	13.4	21.20	9.52	5.42	13.70	9.36	9.17	5.48	7.50	13.29	6.29
1988	31.75	13.0	20.72	9.36	5.36	13.62	9.44	8.69	5.09	6.80	13.53	6.32
1989	31.53	12.8	20.79	9.30	5.43	13.59	9.33	8.61	5.06	7.04	12.94	6.48
1990	33.59	13.5	22.33	9.84	6.01	14.25	10.26	9.08	5.79	7.46	13.46	6.88
1991	35.71	14.2	23.75	10.24	6.34	15.31	11.51	8.88	6.18	7.99	13.78	7.76
1992	38.01	14.8	25.26	10.83	7.59	16.35	12.03	9.63	6.41	8.06	15.20	8.34
1993	39.27	15.1	26.23	10.88	8.13	16.81	12.81	9.65	6.84	8.17	15.38	8.88
1994	38.06	14.5	25.38	10.20	8.42	16.10	13.51	8.45	6.60	7.97	14.73	8.77
1995	36.43	13.8	24.42	9.87	8.57	16.27	12.07	8.08	6.45	6.79	14.46	8.74
1996	36.53	13.7	24.65	9.69	8.70	15.65	12.57	8.32	6.56	6.65	14.10	9.22
1997	35.57	13.3	24.40	9.12	8.31	15.02	12.26	8.30	6.47	6.49	13.75	8.86

**Source:** U.S. Department of Commerce, Bureau of the Census, *March Current Population Survey* (DOC, Census, Washington, DC, 1998).

**Notes:** na = not available. Poverty rate = percent of persons below poverty level. MA = Metropolitan Area. Total includes other races not shown separately. Persons of Hispanic origin may be of any race. Poverty rate for all races for years not shown are: 1959, 22.4; 1960, 22.2; 1961, 21.9; 1962, 21.0; 1963, 19.5; 1964, 19.0; 1965, 17.3; 1966, 14.7; 1967, 14.2; and 1968, 12.8. Poverty thresholds are updated annually to reflect changes in the consumer price index.

# Economy and Environment

**Table 2.1 U.S. Gross Domestic Product, 1959-1997**

Year	Gross domestic product		Implicit price deflator (1992=100)
	Current dollars	Constant (1992) dollars	
	..... billions .....	.....	
1959	507.2	2,210.2	22.95
1960	526.6	2,262.9	23.27
1961	544.8	2,314.3	23.54
1962	585.2	2,454.8	23.84
1963	617.4	2,559.4	24.12
1964	663.0	2,708.4	24.48
1965	719.1	2,881.1	24.96
1966	787.8	3,069.2	25.67
1967	833.6	3,147.2	26.49
1968	910.6	3,293.9	27.64
1969	982.2	3,393.6	28.94
1970	1,035.6	3,397.6	30.48
1971	1,125.4	3,510.0	32.06
1972	1,237.3	3,702.3	33.42
1973	1,382.6	3,916.3	35.30
1974	1,496.9	3,891.2	38.47
1975	1,630.6	3,873.9	42.09
1976	1,819.0	4,082.9	44.55
1977	2,026.9	4,273.6	47.43
1978	2,291.4	4,503.0	50.89
1979	2,557.5	4,630.6	55.23
1980	2,784.2	4,615.0	60.33
1981	3,115.9	4,720.7	66.01
1982	3,242.1	4,620.3	70.17
1983	3,514.5	4,803.7	73.16
1984	3,902.4	5,140.1	75.92
1985	4,180.7	5,323.5	78.53
1986	4,422.2	5,487.7	80.58
1987	4,692.3	5,649.5	83.06
1988	5,049.6	5,865.2	86.09
1989	5,438.7	6,062.0	89.72
1990	5,743.8	6,136.3	93.60
1991	5,916.7	6,079.4	97.32
1992	6,244.4	6,244.4	100.00
1993	6,558.1	6,389.6	102.64
1994	6,947.0	6,610.7	105.09
1995	7,269.6	6,761.7	107.51
1996	7,661.6	6,994.8	109.53
1997	8,110.9	7,269.8	111.57

**Source:** U.S. Department of Commerce, Bureau of Economic Analysis, "Summary National Income and Product Series, 1929-97," *Survey of Current Business* (GPO, Washington, DC, August 1998).

**Table 2.2 U.S. Federal Government Expenditures on Natural Resources and Environment, 1965-1997**

Year	Water resources	Conservation & land management	Recreational resources	Pollution control & abatement	Other natural resources	Total
<i>billions of constant (1992) dollars</i>						
1965	6.21	1.36	0.88	0.52	1.16	10.14
1966	6.62	1.21	0.93	0.62	1.25	10.60
1967	6.38	1.40	1.02	0.72	1.32	10.83
1968	5.93	1.45	1.16	0.90	1.34	10.82
1969	5.49	1.28	1.28	1.04	1.28	10.37
1970	4.95	1.25	1.18	1.25	1.41	10.07
1971	5.52	1.53	1.43	2.18	1.56	12.23
1972	5.83	1.35	1.56	2.27	1.71	12.69
1973	6.29	0.91	1.56	3.17	1.61	13.54
1974	5.72	0.39	1.69	5.30	1.74	14.82
1975	6.20	1.57	1.90	5.99	1.81	17.46
1976	6.15	1.39	1.95	6.89	2.00	18.36
1977	6.77	1.24	2.09	9.02	2.05	21.15
1978	6.74	2.02	2.77	7.80	2.26	21.58
1979	6.97	1.48	2.70	8.53	2.30	21.96
1980	6.99	1.72	2.78	9.13	2.34	22.97
1981	6.26	1.80	2.42	7.83	2.24	20.56
1982	5.63	1.54	2.05	7.14	2.17	18.53
1983	5.33	2.05	1.98	5.82	2.12	17.32
1984	5.36	1.71	2.08	5.32	2.11	16.58
1985	5.25	1.88	2.06	5.69	2.13	17.01
1986	5.01	1.72	1.87	5.99	2.32	16.93
1987	4.55	1.77	1.88	5.86	2.02	16.08
1988	4.68	2.54	1.94	5.61	2.18	16.97
1989	4.76	3.70	2.03	5.44	2.11	18.03
1990	4.70	3.79	2.01	5.52	2.22	18.25
1991	4.49	4.16	2.20	6.02	2.21	19.07
1992	4.56	4.58	2.38	6.08	2.43	20.03
1993	4.15	4.66	2.55	5.90	2.46	19.72
1994	4.31	4.91	2.49	5.76	2.58	20.04
1995	4.46	4.95	2.60	6.06	2.47	20.54
1996	4.22	4.93	2.44	5.64	2.51	19.73
1997	4.07	4.54	2.50	5.64	2.41	19.15

**Source:** U.S. Office of Management and Budget. *The Budget of the United States, Fiscal Year 1999, Historical Tables, Table 3.2* (OMB, Washington, DC, 1998).

**Notes:** Implicit price deflators from Table 2.1 were used to calculate constant dollars. This table provides a tabulation of outlays which comprise the U.S. budget subfunction '300 Natural Resources and Environment.'

**Table 2.3 State and Local Government Expenditures on Natural Resources and Environment, 1965-1995**

Year	Natural resources	Parks & recreation	Sewerage	Solid waste management	Total
<i>billions of constant (1992) dollars</i>					
1965	7.45	4.41	6.29	3.17	21.35
1966	7.95	4.64	6.66	3.35	22.59
1967	8.83	4.87	6.19	3.36	23.25
1968	8.94	5.10	6.26	3.55	23.84
1969	8.81	5.70	6.57	3.70	24.78
1970	8.96	6.20	7.12	4.10	26.35
1971	9.61	6.58	8.27	4.49	28.95
1972	9.34	6.94	9.75	4.76	30.79
1973	9.29	7.25	10.20	4.87	31.61
1974	9.51	7.67	10.61	4.99	32.78
1975	10.03	8.22	12.50	5.18	35.92
1976	10.46	8.66	13.33	5.16	37.64
1977	8.54	10.37	14.86	5.00	38.77
1978	8.31	10.36	14.03	5.36	38.04
1979	8.53	10.68	15.93	5.41	40.54
1980	9.13	10.81	16.39	5.50	41.84
1981	9.36	10.70	16.85	5.73	42.63
1982	9.36	10.69	15.41	5.89	41.34
1983	9.68	11.00	15.36	5.96	42.02
1984	9.77	10.99	15.17	6.20	42.14
1985	10.65	11.66	15.52	6.63	44.47
1986	11.26	12.61	16.52	7.25	47.63
1987	11.97	13.27	18.24	7.83	51.30
1988	11.89	14.02	18.97	8.54	53.42
1989	12.36	14.41	18.99	9.73	55.49
1990	13.17	15.31	19.56	10.83	58.88
1991	12.93	16.37	20.22	11.65	61.17
1992	13.05	15.73	20.34	12.05	61.17
1993	12.83	15.58	22.11	12.39	62.91
1994	13.31	15.87	20.57	13.36	63.12
1995	14.18	16.64	21.93	13.94	66.70

**Sources:** U.S. Department of Commerce, Bureau of the Census, *Historical Statistics on Government Finances and Employment* (data for years 1965 to 1981), *Government Finances* (data for years 1982 to 1987), and *United States State and Local Government Finances by Level of Government* (Internet accessible data for years 1988 to 1995).

**Notes:** Implicit price deflators from Table 2.1 were used to calculate constant dollars. This table provides a tabulation of expenditures for all but one of the subfunctions listed under the Census Bureau function 'Environment and Housing.' The subfunction 'Housing and Community Development' is not included in this table. It should also be noted that Table 2.2 and Table 2.3 are not directly comparable because of definitional differences between categories. For example, federal expenditures for natural resources include, among other categories, multi-purpose power and reclamation projects (including the Tennessee Valley Authority) whereas state and local government expenditures for natural resources do not include such expenditures.

**Table 2.4 U.S. Pollution Abatement and Control Expenditures by Function, 1972-1994**

Year	Pollution abatement		Regulation & monitoring		Research & development		Total	
	billion current dollars	billion constant dollars						
1972	15.45	46.23	0.37	1.11	0.82	2.45	16.64	49.79
1973	17.93	50.79	0.49	1.39	0.90	2.55	19.33	54.76
1974	21.85	56.80	0.60	1.56	0.99	2.57	23.43	60.90
1975	26.55	63.08	0.65	1.54	1.10	2.61	28.30	67.24
1976	29.80	66.89	0.73	1.64	1.28	2.87	31.80	71.38
1977	32.79	69.13	0.83	1.75	1.48	3.12	35.10	74.00
1978	36.90	72.51	0.95	1.87	1.65	3.24	39.50	77.62
1979	42.43	76.82	1.07	1.94	1.78	3.22	45.27	81.97
1980	47.75	79.15	1.26	2.09	1.75	2.90	50.76	84.14
1981	51.39	77.85	1.31	1.98	1.71	2.59	54.41	82.43
1982	52.99	75.52	1.32	1.88	1.64	2.34	55.95	79.73
1983	56.23	76.86	1.30	1.78	1.60	2.19	59.12	80.81
1984	63.26	83.32	1.29	1.70	1.51	1.99	66.06	87.01
1985	68.73	87.52	1.25	1.59	1.38	1.76	71.36	90.87
1986	72.91	90.48	1.46	1.81	1.67	2.07	76.04	94.37
1987	75.61	91.03	1.65	1.99	1.69	2.03	78.95	95.05
1988	80.55	93.56	1.66	1.93	1.54	1.79	83.75	97.28
1989	85.10	94.85	1.73	1.93	1.68	1.87	88.51	98.65
1990	91.61	97.87	1.79	1.91	1.42	1.52	94.82	101.30
1991	93.75	96.33	2.29	2.35	1.87	1.92	97.90	100.60
1992	100.46	100.46	2.60	2.60	1.56	1.56	104.83	104.83
1993	105.84	103.12	2.34	2.28	1.87	1.82	110.05	107.22
1994	117.62	111.92	2.20	2.09	1.99	1.89	121.81	115.91

**Source:** Vogan, C.R., "Pollution Abatement and Control Expenditures, 1972-94," *Survey of Current Business* (GPO, Washington, DC, September 1996).

**Notes:** Implicit price deflators from Table 2.1 were used to calculate constant (1992) dollars. Expenditures are for goods and services that U.S. residents use to produce cleaner air and water and to manage solid waste. Pollution abatement directly reduces emissions by preventing the generation of pollutants, by recycling the pollutants, or by treating the pollutants prior to discharge. Regulation and monitoring are government activities that stimulate and guide action to reduce pollutant emissions. Research and development by business and government not only support abatement but also help increase the efficiency of regulation and monitoring. Totals may not agree with sum of components due to independent rounding. This series was discontinued after 1994.

**Table 2.5 U.S. Pollution Abatement and Control Expenditures by Type, 1972-1994**

Year	Air		Water		Solid waste		Other	
	billion current dollars	billion constant dollars	billion current dollars	billion constant dollars	billion current dollars	billion constant dollars	billion current dollars	billion constant dollars
1972	6.43	19.24	7.21	21.57	3.18	9.52	-0.19	-0.57
1973	7.68	21.76	8.21	23.26	3.59	10.17	-0.15	-0.42
1974	9.68	25.16	9.77	25.40	4.18	10.87	-0.19	-0.49
1975	11.92	28.32	12.07	28.68	4.52	10.74	-0.22	-0.52
1976	13.03	29.25	14.06	31.56	5.00	11.22	-0.28	-0.63
1977	14.72	31.04	14.96	31.54	5.72	12.06	-0.29	-0.61
1978	16.38	32.19	17.00	33.41	6.51	12.79	-0.39	-0.77
1979	19.40	35.13	19.19	34.75	7.28	13.18	-0.59	-1.07
1980	22.35	37.05	20.64	34.21	8.52	14.12	-0.75	-1.24
1981	25.42	38.51	20.15	30.53	9.69	14.68	-0.86	-1.30
1982	25.96	37.00	20.70	29.50	9.80	13.97	-0.52	-0.74
1983	26.68	36.47	21.71	29.67	11.12	15.20	-0.39	-0.53
1984	29.42	38.75	24.18	31.85	13.03	17.16	-0.56	-0.74
1985	30.68	39.07	26.17	33.32	15.18	19.33	-0.66	-0.84
1986	31.43	39.00	28.23	35.03	17.06	21.17	-0.69	-0.86
1987	29.36	35.35	30.76	37.03	19.43	23.39	-0.61	-0.73
1988	31.33	36.39	31.29	36.35	22.43	26.05	-1.30	-1.51
1989	29.34	32.70	33.68	37.54	26.66	29.71	-1.17	-1.30
1990	28.33	30.27	37.13	39.67	30.64	32.74	-1.28	-1.37
1991	27.79	28.56	37.92	38.96	32.83	33.73	-0.63	-0.65
1992	29.79	29.79	39.07	39.07	36.58	36.58	-0.81	-0.81
1993	32.48	31.64	39.38	38.37	38.37	37.38	-0.18	-0.18
1994	37.60	35.78	42.38	40.33	41.74	39.72	0.09	0.09

**Source:** Vogan, C.R., "Pollution Abatement and Control Expenditures, 1972-94," Survey of Current Business (GPO, Washington, DC, September 1996).

**Notes:** Implicit price deflators from Table 2.1 were used to calculate constant (1992) dollars. Expenditures cover most, but not all, pollution abatement and control activities, which are defined as those resulting from rules, policies and conventions, and formal regulations restricting the release of pollutants into common-property media such as the air and water. Solid waste management includes the collection and disposal of solid waste and the alteration of production processes that generate less solid waste. Other covers expenditures for abatement and control of noise, radiation, and pesticide pollution, plus any expenditure not assigned to media (including recovered cost which consists of the value of reclaimed materials and energy). This series was discontinued after 1994.

**Table 2.6 U.S. Pollution Abatement Expenditures by Sector, 1972-1994**

Year	Personal consumption		Business		Government	
	billion current dollars	billion constant dollars	billion current dollars	billion constant dollars	billion current dollars	billion constant dollars
1972	1.35	4.04	10.69	31.99	3.41	10.20
1973	1.86	5.27	12.20	34.56	3.86	10.93
1974	2.33	6.06	14.59	37.93	4.93	12.82
1975	3.25	7.72	16.41	38.99	6.89	16.37
1976	3.81	8.55	18.38	41.26	7.62	17.10
1977	4.34	9.15	21.04	44.36	7.41	15.62
1978	4.85	9.53	23.40	45.98	8.65	17.00
1979	5.52	9.99	26.97	48.83	9.94	18.00
1980	6.65	11.02	29.99	49.71	11.11	18.42
1981	8.20	12.42	32.51	49.25	10.68	16.18
1982	8.36	11.91	33.54	47.80	11.09	15.80
1983	9.76	13.34	35.02	47.87	11.45	15.65
1984	11.04	14.54	39.36	51.84	12.86	16.94
1985	12.16	15.48	42.04	53.53	14.54	18.52
1986	12.68	15.74	44.11	54.74	16.11	19.99
1987	11.34	13.65	46.73	56.26	18.54	22.32
1988	12.48	14.50	48.40	56.22	19.67	22.85
1989	11.09	12.36	52.23	58.21	21.77	24.26
1990	9.33	9.97	58.30	62.29	23.99	25.63
1991	7.43	7.63	61.09	62.77	25.23	25.92
1992	7.90	7.90	65.93	65.93	26.64	26.64
1993	8.44	8.22	69.01	67.23	28.39	27.66
1994	9.76	9.29	76.63	72.92	31.23	29.72

**Source:** Vogan, C.R., "Pollution Abatement and Control Expenditures, 1972-94," *Survey of Current Business* (GPO, Washington, DC, September 1996).

**Notes:** Implicit price deflators from Table 2.1 were used to calculate constant (1992) dollars. Expenditures are attributed to the sector that performs the air or water pollution abatement or solid waste collection and disposal. Personal consumption refers to expenditures to purchase and operate motor vehicle emission abatement devices. Government refers to pollution abatement expenditures by federal, state, and local governments and government enterprise fixed capital expenditures for publicly-owned electric utilities and public sewer systems. This series was discontinued after 1994.

**Table 2.7 U.S. Pollution Abatement Expenditures by Industry, 1973-1994**

Year	Chemicals and allied products								
	Capital expenditures			Operating costs					
	Air	Water	Solid waste	Total	Air	Water	Solid waste	Total	Cost offsets
<i>billions of constant (1992) dollars</i>									
1973	0.47	0.61	0.05	1.12	0.49	0.70	0.23	1.42	0.24
1974	0.65	0.69	0.06	1.40	0.53	0.87	0.27	1.67	0.27
1975	0.85	0.92	0.08	1.85	0.59	1.02	0.30	1.92	0.33
1976	0.72	1.30	0.10	2.11	0.66	1.16	0.39	2.21	0.42
1977	0.72	1.25	0.10	2.07	0.71	1.44	0.46	2.61	0.44
1978	0.74	0.76	0.13	1.63	0.78	1.56	0.55	2.89	0.45
1979	0.57	0.65	0.17	1.40	0.88	1.62	0.52	3.02	0.42
1980	0.54	0.58	0.17	1.29	0.89	1.56	0.61	3.07	0.51
1981	0.51	0.49	0.14	1.14	0.87	1.62	0.62	3.10	0.52
1982	0.39	0.37	0.14	0.89	0.79	1.59	0.62	3.00	0.49
1983	0.22	0.26	0.07	0.54	0.85	1.51	0.64	3.00	0.41
1984	0.19	0.28	0.04	0.55	0.82	1.59	0.68	3.09	0.47
1985	0.25	0.35	0.35	0.94	0.86	1.61	0.76	3.23	0.34
1986	0.25	0.40	0.13	0.77	0.80	1.62	0.88	3.29	0.42
1987	nd	nd	nd	nd	nd	nd	nd	nd	nd
1988	0.43	0.57	0.27	1.27	0.82	1.66	1.09	3.57	0.52
1989	0.42	0.67	0.24	1.33	0.88	1.80	1.23	3.91	0.44
1990	0.64	1.06	0.28	1.98	0.90	1.92	1.39	4.21	0.43
1991	0.84	0.97	0.32	2.12	0.90	1.84	1.42	4.16	0.36
1992	0.77	1.02	0.33	2.12	1.03	1.95	1.45	4.43	0.51
1993	0.75	0.91	0.25	1.91	0.99	1.91	1.34	4.24	0.35
1994	0.64	0.96	0.24	1.84	1.08	1.90	1.36	4.35	0.31
Petroleum and coal products									
1973	0.63	0.27	0.01	0.91	0.55	0.36	0.06	0.96	0.13
1974	0.89	0.31	0.00	1.20	0.62	0.40	0.07	1.09	0.22
1975	0.95	0.37	0.00	1.32	0.81	0.46	0.08	1.34	0.33
1976	0.53	0.45	0.01	0.99	1.05	0.59	0.10	1.74	0.41
1977	0.35	0.41	0.01	0.78	1.27	0.61	0.12	2.00	0.50
1978	0.61	0.20	0.01	0.82	1.25	0.60	0.11	1.96	0.51
1979	0.72	0.22	0.03	0.97	1.36	0.67	0.05	2.13	0.59
1980	0.67	0.19	0.03	0.88	1.51	0.67	0.17	2.35	0.84
1981	0.67	0.20	0.03	0.89	1.69	0.66	0.20	2.55	0.86
1982	0.76	0.24	0.02	1.01	1.70	0.67	0.19	2.57	0.48
1983	0.42	0.23	0.02	0.66	1.65	0.75	0.19	2.59	0.72
1984	0.26	0.13	0.03	0.41	1.75	0.77	0.23	2.74	0.73
1985	0.22	0.11	0.03	0.37	1.63	0.75	0.25	2.63	0.64
1986	0.34	0.15	0.04	0.53	1.53	0.72	0.24	2.49	0.62
1987	nd	nd	nd	nd	nd	nd	nd	nd	nd
1988	0.24	0.24	0.08	0.56	1.37	0.65	0.31	2.33	0.56
1989	0.16	0.26	0.05	0.47	1.40	0.65	0.37	2.42	0.58
1990	0.45	0.43	0.10	0.98	1.57	0.75	0.57	2.89	0.60
1991	1.02	0.38	0.10	1.50	1.51	0.82	0.61	2.93	0.49
1992	2.08	0.49	0.11	2.69	1.43	0.74	0.41	2.59	0.48
1993	1.92	0.55	0.10	2.58	1.54	0.67	0.37	2.58	0.41
1994	1.89	0.44	0.12	2.45	1.66	0.72	0.40	2.77	0.32

See next page for continuation of table.

**Table 2.7 U.S. Pollution Abatement Expenditures by Industry, 1973-1994 (continued)**

Year	Primary metal industries								
	Capital expenditures			Operating costs					
	Air	Water	Solid waste	Total	Air	Water	Solid waste	Total	Cost offsets
<i>billions of constant (1992) dollars</i>									
1973	1.13	0.24	0.05	1.41	0.75	0.42	0.15	1.32	0.15
1974	1.33	0.34	0.03	1.68	0.88	0.47	0.18	1.53	0.20
1975	1.52	0.45	0.01	1.98	1.02	0.50	0.18	1.70	0.23
1976	1.42	0.44	0.01	1.87	1.29	0.52	0.20	2.01	0.23
1977	1.30	0.53	0.02	1.84	1.52	0.57	0.28	2.37	0.27
1978	1.11	0.43	0.02	1.56	1.59	0.65	0.35	2.60	0.28
1979	1.07	0.41	0.01	1.49	1.78	0.80	0.30	2.87	0.44
1980	0.89	0.30	0.03	1.23	1.65	0.77	0.36	2.78	0.28
1981	0.86	0.22	0.03	1.10	1.68	0.83	0.38	2.90	0.29
1982	0.60	0.19	0.02	0.81	1.28	0.64	0.24	2.16	0.21
1983	0.20	0.14	0.01	0.31	1.24	0.62	0.35	2.21	0.13
1984	0.23	0.10	0.03	0.36	1.34	0.59	0.40	2.33	0.23
1985	0.18	0.11	0.03	0.32	1.36	0.66	0.35	2.37	0.17
1986	0.13	0.09	0.06	0.28	1.20	0.63	0.33	2.14	0.23
1987	nd	nd	nd	nd	nd	nd	nd	nd	nd
1988	0.19	0.12	0.05	0.36	1.12	0.60	0.38	2.10	0.22
1989	0.24	0.15	0.06	0.45	0.98	0.64	0.53	2.15	0.21
1990	0.30	0.18	0.06	0.53	1.01	0.60	0.55	2.16	0.22
1991	0.51	0.14	0.04	0.69	0.94	0.58	0.54	2.06	0.19
1992	0.34	0.12	0.06	0.53	0.93	0.58	0.49	1.99	0.16
1993	0.27	0.09	0.07	0.43	0.92	0.58	0.46	1.97	0.13
1994	0.28	0.09	0.04	0.41	0.93	0.66	0.51	2.10	0.13
Transportation equipment									
1973	0.15	0.12	0.02	0.29	0.10	0.14	0.12	0.37	0.06
1974	0.14	0.11	0.02	0.27	0.12	0.15	0.13	0.40	0.04
1975	0.08	0.09	0.02	0.18	0.12	0.16	0.12	0.40	0.03
1976	0.05	0.12	0.01	0.18	0.13	0.19	0.13	0.44	0.03
1977	0.08	0.08	0.01	0.17	0.13	0.21	0.16	0.49	0.03
1978	0.14	0.11	0.02	0.27	0.15	0.22	0.18	0.55	0.03
1979	0.22	0.11	0.02	0.34	0.17	0.23	0.20	0.60	0.07
1980	0.33	0.10	0.02	0.46	0.18	0.23	0.25	0.67	0.04
1981	0.32	0.09	0.02	0.43	0.18	0.23	0.24	0.65	0.03
1982	0.09	0.05	0.02	0.15	0.15	0.22	0.20	0.57	0.03
1983	0.05	0.08	0.01	0.13	0.22	0.31	0.24	0.77	0.03
1984	0.09	0.15	0.03	0.27	0.25	0.37	0.28	0.90	0.03
1985	0.32	0.21	0.05	0.58	0.25	0.36	0.33	0.94	0.03
1986	0.54	0.10	0.03	0.67	0.24	0.42	0.38	1.04	0.03
1987	nd	nd	nd	nd	nd	nd	nd	nd	nd
1988	0.10	0.09	0.05	0.24	0.25	0.35	0.53	1.13	0.04
1989	0.17	0.09	0.05	0.32	0.24	0.35	0.52	1.11	0.05
1990	0.22	0.15	0.05	0.42	0.26	0.40	0.65	1.32	0.04
1991	0.18	0.10	0.03	0.31	0.26	0.33	0.56	1.15	0.05
1992	0.18	0.07	0.03	0.28	0.30	0.35	0.53	1.17	0.07
1993	0.17	0.07	0.03	0.27	0.29	0.34	0.53	1.16	0.06
1994	0.23	0.06	0.03	0.32	0.28	0.33	0.46	1.06	0.07

See next page for continuation of table.

**Table 2.7. U.S. Pollution Abatement Expenditures by Industry, 1973-1994 (continued)**

Year	Food and kindred products								
	Capital expenditures				Operating costs				
	Air	Water	Solid waste	Total	Air	Water	Solid waste	Total	Cost offsets
..... <i>billions of constant (1992) dollars</i> .....									
1973	0.22	0.30	0.04	0.56	0.11	0.31	0.15	0.58	0.09
1974	0.19	0.29	0.04	0.52	0.13	0.37	0.20	0.70	0.14
1975	0.18	0.22	0.03	0.43	0.13	0.37	0.21	0.70	0.15
1976	0.23	0.22	0.02	0.47	0.13	0.42	0.23	0.78	0.14
1977	0.14	0.22	0.03	0.39	0.12	0.45	0.19	0.75	0.11
1978	0.13	0.19	0.03	0.34	0.14	0.48	0.20	0.81	0.11
1979	0.10	0.20	0.02	0.33	0.16	0.54	0.21	0.91	0.15
1980	0.10	0.22	0.02	0.35	0.14	0.52	0.20	0.86	0.13
1981	0.08	0.16	0.02	0.26	0.12	0.52	0.24	0.88	0.14
1982	0.07	0.16	0.02	0.24	0.11	0.47	0.17	0.74	0.07
1983	0.05	0.14	0.01	0.21	0.13	0.55	0.21	0.89	0.04
1984	0.07	0.12	0.02	0.20	0.13	0.60	0.20	0.94	0.06
1985	0.08	0.10	0.01	0.20	0.14	0.67	0.26	1.06	0.04
1986	0.08	0.13	0.02	0.23	0.16	0.69	0.31	1.16	w/h
1987	nd	nd	nd	nd	nd	nd	nd	nd	nd
1988	0.12	0.11	0.02	0.25	0.18	0.78	0.38	1.35	0.13
1989	0.06	0.20	0.03	0.29	0.15	0.74	0.28	1.18	0.09
1990	0.07	0.17	0.02	0.27	0.16	0.74	0.29	1.18	0.09
1991	0.10	0.37	0.03	0.50	0.15	0.81	0.32	1.29	0.07
1992	0.09	0.20	0.03	0.32	0.16	0.84	0.31	1.31	0.08
1993	0.07	0.11	0.03	0.21	0.15	0.84	0.32	1.30	0.06
1994	0.10	0.15	0.01	0.26	0.16	0.89	0.32	1.38	0.09
.....									
Paper and allied products									
1973	0.47	0.46	0.03	0.96	0.17	0.33	0.12	0.62	0.15
1974	0.70	0.50	0.03	1.24	0.21	0.40	0.14	0.75	0.22
1975	0.77	0.63	0.04	1.44	0.24	0.44	0.14	0.82	0.27
1976	0.41	0.63	0.06	1.09	0.28	0.54	0.15	0.97	0.31
1977	0.28	0.55	0.07	0.90	0.28	0.65	0.18	1.12	0.32
1978	0.24	0.37	0.06	0.67	0.31	0.70	0.21	1.22	0.35
1979	0.37	0.33	0.07	0.77	0.32	0.73	0.22	1.26	0.29
1980	0.33	0.18	0.05	0.56	0.33	0.72	0.21	1.26	0.41
1981	0.25	0.13	0.05	0.43	0.32	0.71	0.22	1.26	0.45
1982	0.27	0.13	0.04	0.45	0.29	0.65	0.19	1.13	0.30
1983	0.17	0.09	0.04	0.30	0.31	0.70	0.25	1.26	0.35
1984	0.20	0.09	0.06	0.35	0.37	0.75	0.28	1.40	0.16
1985	0.24	0.13	0.05	0.42	0.40	0.73	0.30	1.43	0.14
1986	0.17	0.12	0.05	0.34	0.40	0.70	0.33	1.43	0.17
1987	nd	nd	nd	nd	nd	nd	nd	nd	nd
1988	0.27	0.11	0.10	0.49	0.43	0.73	0.40	1.56	0.29
1989	0.44	0.29	0.17	0.90	0.43	0.77	0.42	1.62	0.30
1990	0.44	0.54	0.16	1.15	0.42	0.84	0.45	1.72	0.28
1991	0.49	0.57	0.20	1.27	0.41	0.81	0.46	1.68	0.18
1992	0.40	0.37	0.23	1.00	0.54	0.82	0.50	1.86	0.25
1993	0.30	0.28	0.12	0.70	0.50	0.83	0.52	1.85	0.23
1994	0.23	0.19	0.19	0.61	0.51	0.79	0.49	1.79	0.27

See next page for continuation of table.

**Table 2.7 U.S. Pollution Abatement Expenditures by Industry, 1973-1994 (continued)**

Year	Rubber and miscellaneous plastic products									
	Capital expenditures				Operating costs					
	Air	Water	Solid waste	Total	Air	Water	Solid waste	Total	Cost offsets	
..... billions of constant (1992) dollars .....										
1973	0.04	0.02	0.01	0.07	0.03	0.03	0.06	0.12	0.01	
1974	0.06	0.04	0.01	0.10	0.04	0.04	0.07	0.15	0.05	
1975	0.05	0.02	0.01	0.08	0.05	0.04	0.06	0.15	0.03	
1976	0.05	0.02	0.01	0.08	0.05	0.05	0.08	0.18	0.04	
1977	0.04	0.03	0.01	0.08	0.04	0.04	0.07	0.16	0.02	
1978	0.04	0.01	0.01	0.05	0.03	0.05	0.09	0.17	0.02	
1979	0.02	0.02	0.01	0.05	0.06	0.05	0.09	0.20	0.02	
1980	0.02	0.01	0.00	0.04	0.05	0.05	0.08	0.18	0.03	
1981	0.02	0.01	0.01	0.03	0.05	0.04	0.09	0.18	0.02	
1982	0.02	0.01	0.00	0.04	0.03	0.04	0.06	0.13	0.01	
1983	0.02	0.01	0.01	0.03	0.07	0.07	0.08	0.23	0.01	
1984	0.03	0.01	0.01	0.04	0.07	0.06	0.09	0.22	0.01	
1985	0.03	0.00	0.01	0.04	0.06	0.07	0.12	0.25	0.01	
1986	0.02	0.01	0.01	0.04	0.06	0.06	0.15	0.28	0.02	
1987	nd	nd	nd	nd	nd	nd	nd	nd	nd	
1988	0.03	0.01	0.01	0.05	0.07	0.07	0.18	0.32	0.02	
1989	0.06	0.02	0.01	0.09	0.10	0.11	0.24	0.45	0.03	
1990	0.07	0.01	0.01	0.10	0.10	0.12	0.23	0.46	0.03	
1991	0.05	0.02	0.01	0.08	0.12	0.08	0.25	0.45	0.03	
1992	0.07	0.02	0.01	0.10	0.11	0.07	0.20	0.38	0.03	
1993	0.04	0.01	0.01	0.06	0.10	0.08	0.19	0.38	0.02	
1994	0.05	0.02	0.01	0.07	0.11	0.09	0.22	0.42	0.03	

**Source:** U.S. Department of Commerce, Bureau of the Census, *Pollution Abatement Costs and Expenditures, Current Industrial Reports* (GPO, Washington, DC, annual).

**Notes:** nd = no data. Data for 1987 were not collected. w/h = withheld by industry. Data are for selected industries. Does not include all industries covered in the survey. This series was discontinued after 1994.

**Table 2.8 Employment and Revenues in U.S. Environmental Industries, 1980 to 1996**

Industry	Employment			Revenues		
	1980	1990	1996	1980	1990	1996
	.....	thousands	.....	billions of constant dollars	.....	.....
Analytical services <sup>1</sup>	6.0	20.2	16.5	0.7	1.6	1.4
Water treatment works <sup>2</sup>	53.9	95.0	120.9	15.2	21.2	24.3
Solid waste management <sup>3</sup>	83.2	209.5	234.6	14.1	27.9	30.9
Hazardous waste management <sup>4</sup>	6.8	56.9	51.2	1.0	6.7	5.5
Remediation/industrial services	6.9	107.2	95.3	0.7	9.1	7.9
Consulting & engineering	20.5	144.2	159.7	2.5	13.4	14.2
Water equipment & chemicals	62.4	97.9	123.3	10.4	14.4	15.9
Instrument manufacturing	0.5	18.8	26.6	0.3	2.1	2.9
Air pollution control equipment <sup>5</sup>	28.3	82.7	82.6	5.0	11.4	10.8
Waste management equipment <sup>6</sup>	41.9	88.8	94.9	6.6	11.1	11.0
Process & prevention technology	2.1	8.9	20.3	0.2	0.4	0.8
Water utilities <sup>7</sup>	76.9	104.7	122.2	19.7	21.2	24.0
Resource recovery <sup>8</sup>	48.7	118.4	131.3	7.3	14.0	14.9
Environmental energy sources <sup>9</sup>	22.4	21.1	26.7	2.5	1.9	2.2
Total <sup>10</sup>	462.5	1,174.3	1,306.1	86.2	156.4	168.3

**Source:** Environmental Business International, Inc., *Environmental Business Journal*, (Environmental Business International, Inc., San Diego, CA, monthly).

**Notes:** Implicit price deflators from Table 2.1 were used to calculate constant (1992) dollars.  
<sup>1</sup>Covers environmental laboratory testing and services. <sup>2</sup>Mostly revenues collected by municipal entities. <sup>3</sup>Covers activities such as collection, transportation, transfer stations, disposal, landfill ownership, and management for solid waste. <sup>4</sup>Transportation and disposal of hazardous, medical, and nuclear waste. <sup>5</sup>Includes stationary and mobile sources. <sup>6</sup>Includes vehicles, containers, liners, processing, and remedial equipment. <sup>7</sup>Revenues generated from the sale year. <sup>8</sup>Revenues generated from the sale of recovered metals, paper, plastic, etc. <sup>9</sup>Includes solar, geothermal, and conservation devices. <sup>10</sup>Covers approximately 59,000 private and public companies engaged in environmental activities.

**Table 2.9 Summary of Value of Selected Product Shipments and Receipts for Selected Services and Types of Construction Projects for Environmental or Potential Environmental Purposes by Media, 1995**

Selected products, services, and types of construction projects	Value of product shipments and receipts for services and types of construction projects				Relative standard error	
	For environmental purposes		Not for environmental purposes		All	For environmental purposes percent
	All	pur-	en-	viron-	Pur-	en-
<i>billions of constant (1992) dollars</i>						
Air treatment	5.57	5.47	0.08	0.03	15	15
Water & wastewater treatment	33.86	28.92	4.02	0.93	8	8
Solid waste	35.37	33.38	1.43	0.56	11	12
Energy conservation	7.10	2.28	4.54	0.28	14	11
Noise pollution control	1.36	0.16	1.16	0.04	41	43
Monitoring, assessm't & analysis	15.85	4.99	5.67	5.19	26	19
Admin., management, engineering	55.51	5.84	48.90	0.78	27	18
Other	14.58	14.58	-	-	25	25
Total	169.21	95.61	65.79	7.81	15	6

**Source:** U.S. Department of Commerce, Bureau of the Census, *Survey of Environmental Products and Services* (sponsored by the Environmental Protection Agency, the International Trade Administration, and the Bureau of the Census) (DOC, Census, Washington, DC, 1998).

**Table 2.10 Expenditures for Air Pollution Control, 1972-1990**

Year	Stationary		Rec. costs	Mobile source		Other	Total
	K	O & M		K	O & M		
<i>billions of constant (1992) dollars</i>							
1972	6.69	na	na	na	na	na	na
1973	8.64	4.07	0.56	0.78	5.00	2.37	20.29
1974	8.92	4.93	0.77	0.63	6.11	2.25	22.07
1975	9.54	5.32	0.92	3.73	5.42	2.13	25.22
1976	8.88	5.98	1.11	4.40	4.62	2.26	25.03
1977	8.45	6.80	1.17	4.74	3.77	2.48	25.05
1978	8.22	7.32	1.21	4.94	1.78	2.60	23.65
1979	8.87	8.34	1.36	5.33	2.23	2.62	26.02
1980	9.03	9.23	1.43	4.89	2.97	2.34	27.02
1981	8.46	9.28	1.51	5.35	2.10	2.04	25.73
1982	7.97	8.29	1.22	5.06	0.79	1.85	22.74
1983	6.26	8.60	1.12	5.92	-0.21	1.77	21.21
1984	6.19	9.01	1.15	7.48	-0.43	1.73	22.83
1985	5.69	9.15	0.98	8.13	0.43	1.89	24.32
1986	5.46	9.00	1.08	8.55	-1.73	1.92	22.13
1987	5.36	9.15	1.19	8.25	-1.57	1.92	21.93
1988	5.24	8.68	1.29	8.37	-1.83	1.94	21.12
1989	5.57	8.82	1.25	7.86	-1.82	1.99	21.17
1990	4.70	9.45	1.34	7.81	-1.94	1.65	20.32

**Source:** U.S. Environmental Protection Agency, Office of Policy, Planning and Evaluation and Office of Air and Radiation, *The Benefits and Costs of the Clean Air Act, 1970 to 1990* (EPA, OPPE and OAR, Washington, DC, 1997).

**Notes:** K = Capital expenditures. O&M = Operations and Maintenance. Rec. costs = recovered costs. Implicit price deflators from Table 2.1 were used to calculate constant dollars. Total expenditures are the sum of stationary source, mobile source, and "other" expenditures, less recovered costs. Capital expenditures for stationary air pollution control are made by factories and electric utilities for plant and equipment that abate pollutants through end-of-line techniques or that reduce or eliminate the generation of pollutants through changes-in-production process. Stationary source O&M expenditures are made by manufacturing establishments and electric utilities to operate air pollution abatement equipment. Recovered costs consist of the value of materials or energy reclaimed through abatement activities that are reused in production and revenue that was obtained from the sale of materials or energy reclaimed through abatement activities. Capital expenditures for mobile source emission control are associated with pollution abatement equipment on passenger cars. O&M costs for emission control devices include the costs of maintaining pollution control equipment plus the cost of vehicle inspection maintenance programs. Other includes air pollution control costs by federal and state governments, government costs to develop and enforce Clean Air Act regulations, and public and private air pollution control research and development expenditures.

# Public Lands and Recreation

**Table 3.1 Lands Under the Control of Selected Federal Agencies, 1970-1997**

Year	National Park System	National Wildlife Refuge System	National Forest System million acres	Bureau of Reclamation	Bureau of Land Management
1970	29.6	30.7	182.6	9.4	451.1
1971	29.9	30.9	182.6	8.2	451.0
1972	30.4	31.1	182.8	8.3	450.9
1973	30.5	31.1	183.0	8.2	450.8
1974	31.1	33.9	182.1	8.2	447.3
1975	31.0	34.1	183.3	8.0	447.3
1976	31.3	34.4	183.4	7.3	446.8
1977	31.3	34.5	183.5	7.3	427.2
1978	76.7	34.6	183.6	7.1	457.4
1979	76.7	46.8	183.2	7.1	397.5
1980	77.0	71.9	183.1	7.2	343.0
1981	79.1	88.8	186.4	7.1	343.4
1982	79.4	88.8	186.6	7.1	341.1
1983	79.4	88.9	186.5	7.0	342.3
1984	79.4	90.2	186.4	7.9	341.9
1985	79.5	90.4	186.3	7.8	337.1
1986	79.5	90.5	186.5	9.0	334.1
1987	79.6	90.6	186.5	8.5	333.6
1988	80.0	90.8	186.3	8.8	270.4
1989	80.1	91.3	186.9	8.6	269.6
1990	80.2	90.6	187.1	9.0	272.0
1991	80.3	90.8	187.0	8.6	269.0
1992	80.7	91.0	187.1	8.6	268.5
1993	80.3	91.5	187.2	8.6	267.6
1994	83.3	91.8	187.3	8.6	267.1
1995	83.2	92.3	187.2	8.6	264.3
1996	83.2	92.6	187.3	8.6	264.3
1997	83.4	93.1	187.4	8.6	263.9

**Sources:** U.S. Department of Agriculture, Forest Service, *Land Areas of the National Forest System* (USDA, FS, Washington, DC, annual).

U.S. Department of the Interior, Fish and Wildlife Service, *Lands Under the Control of the U.S. Fish and Wildlife Service* (DOI, FWS, Washington, DC, annual).

U.S. Department of the Interior, National Park Service, *Areas Administered by the National Park Service: Information Tables* (DOI, NPS, Washington, DC, annual).

U.S. Department of the Interior, Bureau of Land Management, *Public Land Statistics* (DOI, BLM, Washington, DC, annual).

U.S. Department of the Interior, Bureau of Reclamation, unpublished, Denver, CO, 1998.

**Notes:** Data reflect year-end cumulative totals. National Park Service data for 1978-1997 are not directly comparable with data for earlier years due to reclassification of several sites within the system.

**Table 3.2 National Wilderness Preservation System and National Wild and Scenic River System, 1968-1997**

Year	National Wilderness Preservation System <i>million acres</i>	National Wild and Scenic River System <i>river miles</i>
1968	10.03	773
1969	10.19	773
1970	10.40	868
1971	10.40	868
1972	11.03	895
1973	11.03	961
1974	11.38	1,018
1975	12.72	1,145
1976	14.45	1,610
1977	14.49	1,610
1978	19.00	2,299
1979	19.00	2,299
1980	79.71	5,662
1981	79.84	6,908
1982	79.88	6,908
1983	80.21	6,908
1984	88.55	7,217
1985	88.70	7,224
1986	88.80	7,363
1987	88.99	7,709
1988	90.81	9,264
1989	91.46	9,281
1990	94.97	9,318
1991	95.03	9,463
1992	95.39	10,295
1993	95.44	10,516
1994	103.72	10,734
1995	103.60	10,734
1996	103.60	10,815
1997	103.60	10,815

**Sources:** U.S. Department of Agriculture, Forest Service, National Wilderness Preservation System Fact Sheet, unpublished, Washington, DC, annual.

U.S. Department of the Interior, National Park Service, River Mileage Classifications for Components of the National Wild and Scenic River System, unpublished, Washington, DC, annual.

**Note:** Data reflect year-end cumulative totals.

**Table 3.3 National Estuarine Research Reserves and National Marine Sanctuaries, 1975-1997**

Year	Estuarine Research Reserves		Marine Sanctuaries	
	number	acres	number	sq. nmi.
1975	1	4,700	2	101.0
1976	3	14,205	2	101.0
1977	3	14,205	2	101.0
1978	4	22,605	2	101.0
1979	5	216,363	2	101.0
1980	9	223,426	3	1,353.0
1981	11	229,652	6	2,323.3
1982	14	240,571	6	2,323.3
1984	15	242,121	6	2,323.3
1986	16	245,149	7	2,323.6
1987	16	245,149	7	2,323.6
1988	17	247,348	7	2,323.6
1989	18	253,477	8	2,720.7
1990	18	259,945	9	5,415.3
1991	19	399,302	9	5,415.3
1992	21	400,559	13	11,419.3
1993	22	401,570	13	11,419.3
1994	22	433,864	14	11,419.3
1995	22	433,865	14	11,419.3
1996	21 <sup>1</sup>	427,528	14	11,419.3
1997	21	427,528	12 <sup>2</sup>	13,837.3

**Source:** U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, Office of Ocean and Coastal Resources Management, Sanctuaries and Reserves Division, unpublished, Washington, DC, 1997.

**Notes:** sq. nmi. = square nautical miles. <sup>1</sup>The Waimanu, Hawaii National Estuarine Research Reserve (NERR) site was withdrawn from the NERR System on May 1, 1996. <sup>2</sup>The Florida Keys National Marine Sanctuary incorporated the pre-existing sanctuaries at Looe Key and Key Largo, effective July 1, 1997.

**Table 3.4 National Register of Historic Places, 1967-1997**

Year	Properties listed		Year	Properties removed	
	.....	number		.....	number
1967	873	2	1983	35,112	434
1968	903	3	1984	39,121	440
1969	1,106	4	1985	42,538	445
1970	1,888	19	1986	45,936	452
1971	3,026	51	1987	48,254	525
1972	4,376	93	1988	51,286	574
1973	6,646	144	1989	53,838	635
1974	8,247	188	1990	56,688	651
1975	10,805	231	1991	58,209	683
1976	12,561	265	1992	60,500	716
1977	14,203	290	1993	62,095	749
1978	16,575	338	1994	63,710	792
1979	20,589	366	1995	65,255	810
1980	24,680	403	1996	66,805	833
1981	26,499	406	1997	68,394	816
1982	29,999	420			

**Source:** U.S. Department of the Interior, National Park Service, The National Register of Historic Places, National Register Information System (an Internet accessible database).

**Note:** Data are year-end cumulative totals.

**Table 3.5 Recreational Fishing and Hunting in the United States, 1955-1996**

Year	Fishermen			Hunters			Total sports- men	
	Fresh- water	Salt- water	Total	Small game	Big game	Water- fowl		
	..... millions .....							
1955	18.42	4.56	20.81	9.82	4.41	1.99	11.78	24.92
1960	21.68	6.29	25.32	12.11	6.28	1.96	14.64	30.44
1965	23.96	8.31	28.34	10.58	6.57	1.65	13.58	32.88
1970	29.36	9.46	33.15	11.67	7.77	2.89	14.34	36.28
1975	36.60	13.74	41.29	14.18	11.04	4.28	17.09	45.77
1980	35.78	11.97	41.87	12.50	11.05	3.18	16.76	46.97
1985	39.12	12.89	45.35	11.13	12.58	3.20	16.34	49.83
1991	31.04	8.89	39.98	7.64	10.75	3.01	14.06	39.98
1996	29.73	9.44	39.69	6.93	11.27	3.04	13.98	39.69

  

Year	Fishing days			Hunting days			Total sporting days	
	Fresh- water	Salt- water	Total	Small game	Big game	Water- fowl		
	..... millions .....							
1955	338.83	58.62	397.45	118.63	30.83	19.96	169.42	566.87
1960	385.17	80.60	465.77	138.19	39.19	15.16	192.54	658.31
1965	426.92	95.84	522.76	128.45	43.85	13.53	185.82	708.58
1970	592.49	113.69	706.19	124.04	54.54	25.11	203.69	909.88
1975	890.58	167.50	1,050.08	269.65	100.60	31.22	401.48	1,459.55
1980	788.39	164.04	952.42	225.79	117.41	26.18	348.54	1,300.98
1985	895.03	171.06	1,064.99	214.54	135.45	25.93	350.39	1,415.38
1991	439.54	74.70	511.24	77.13	128.41	22.24	227.78	761.33
1996	513.74	103.03	623.54	75.02	153.72	26.50	255.56	879.10

**Sources:** U.S. Department of the Interior, Fish and Wildlife Service, *National Survey of Fishing, Hunting, and Wildlife-Associated Recreation* (DOI, FWS, Washington, DC, 1993).

--, 1996 *National Survey of Fishing, Hunting, and Wildlife-Associated Recreation: National Overview* (DOI, FWS, Washington, DC, 1997).

**Notes:** Number of fishermen and hunters includes persons 16 years and older. Total number of hunters includes 1,411 hunters of other animals in 1991 and 1,472 in 1996. Totals may not agree with sum of components due to independent rounding and because of multiple responses (e.g., where sportsmen participate in more than one activity per outing). Estimates for 1991 and 1996 are comparable because of similar survey methodologies. However, these estimates are not strictly comparable with estimates from previous surveys because of differences in survey methodologies.

**Table 3.6 U.S. Marine Recreational Fisheries by Region, 1981-1997**

Year	North Atlantic			Mid-Atlantic			South Atlantic		
	Fishing trips	Fish caught	Fish weight	Fishing trips	Fish caught	Fish weight	Fishing trips	Fish caught	Fish weight
	number in millions	million pounds	number in millions	million pounds	number in millions	million pounds	number in millions	million pounds	number in millions
1981	5.76	36.98	68.79	14.01	100.82	118.56	8.55	44.48	37.87
1982	7.04	46.75	85.71	15.50	81.15	105.42	13.63	64.15	48.53
1983	7.10	35.20	68.38	18.57	125.02	124.65	14.46	62.99	65.20
1984	5.32	24.58	39.63	15.76	101.11	100.53	15.09	59.77	50.05
1985	7.07	41.08	59.43	14.74	90.85	79.40	15.32	67.18	59.96
1986	7.48	49.89	81.97	18.84	153.94	135.53	14.90	59.42	53.56
1987	5.78	34.29	55.17	14.72	99.92	116.72	16.95	50.30	51.56
1988	5.74	25.72	39.73	14.90	77.90	85.89	18.82	56.08	54.85
1989	5.23	24.58	33.10	12.17	64.58	76.97	16.36	46.05	46.35
1990	5.54	18.65	28.89	13.35	84.59	56.80	13.57	40.78	35.77
1991	6.80	26.69	35.63	15.98	126.00	65.19	17.39	54.95	47.66
1992	5.70	17.74	21.17	12.22	75.03	47.33	16.74	54.09	45.00
1993	6.23	20.99	24.30	15.29	97.57	55.08	16.80	50.89	37.35
1994	6.28	25.88	23.92	16.24	94.95	45.86	19.93	72.17	50.09
1995	6.51	21.98	19.79	15.58	88.52	58.87	18.75	65.24	50.44
1996	6.76	23.43	21.29	16.50	86.42	55.74	16.82	51.26	43.76
1997	7.63	23.78	19.32	17.23	96.55	60.24	18.00	58.30	49.32
Year	Gulf of Mexico <sup>1</sup>			Total Atlantic & Gulf			Pacific <sup>2</sup>		
	Fishing trips	Fish caught	Fish weight	Fishing trips	Fish caught	Fish weight	Fishing trips	Fish caught	Fish weight
	number in millions	million pounds	number in millions	million pounds	number in millions	million pounds	number in millions	million pounds	number in millions
1981	12.06	87.39	53.00	40.38	269.67	278.22	11.00	51.00	na
1982	13.42	113.33	75.70	49.59	305.38	315.36	11.00	53.00	na
1983	19.98	146.17	80.92	60.11	369.38	339.15	11.00	44.52	na
1984	19.64	133.87	71.75	55.81	319.33	261.97	10.00	46.84	na
1985	15.42	101.20	65.45	52.55	300.30	264.23	9.90	43.18	na
1986	19.04	144.08	96.56	60.26	407.32	367.62	11.03	55.31	na
1987	16.09	101.56	66.54	53.54	286.08	289.98	9.97	47.54	na
1988	19.74	130.95	70.85	59.20	290.65	251.31	12.42	51.22	na
1989	15.62	113.91	66.90	48.38	249.11	223.32	9.45	41.29	na
1990	13.31	106.38	51.55	45.77	250.40	173.00	na	na	na
1991	18.17	177.34	79.77	58.34	284.98	228.24	na	na	na
1992	18.08	145.03	68.93	52.74	291.88	182.40	na	na	na
1993	17.43	147.33	68.52	54.75	316.78	185.24	6.89	30.92	20.94
1994	17.50	148.86	63.57	59.95	341.85	183.44	7.19	27.17	17.92
1995	17.12	135.78	73.06	57.96	311.53	202.16	7.22	27.61	24.31
1996	16.32	118.63	64.57	56.40	279.73	185.35	7.77	34.05	23.19
1997	18.10	139.82	79.31	60.95	318.44	208.19	7.19	29.00	26.01

**Source:** U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, *Fisheries of the United States 1997* (GPO, Washington, DC, 1998).

**Notes:** na = not available. <sup>1</sup>Does not include Texas. <sup>2</sup>Does not include Washington for 1993-1996.

**Table 3.7 Visits to Selected U.S. Federal Recreation Areas, 1977-1997**

Year	National Parks million visits	National Wildlife Refuges ..... million visitors .....	Bureau of Reclamation Recreation Areas ..... million visitors .....	National Forests .....	Army Corps of Engineers Reservoirs ..... million visitor days .....	Bureau of Land Management Lands .....
1977	211	27	55	205	424	na
1978	222	26	63	219	439	na
1979	205	25	59	220	449	na
1980	198	23	60	234	457	na
1981	210	26	69	236	469	64
1982	214	24	63	233	480	40
1983	217	22	66	228	480	42
1984	218	23	76	228	482	34
1985	216	24	76	225	502	31
1986	237	25	80	237	506	36
1987	246	25	80	239	181	64
1988	250	26	82	242	191	57
1989	256	26	84	253	191	50
1990	263	27	80	263	190	70
1991	268	28	80	279	192	68
1992	275	28	83	287	203	65
1993	273	28	84	296	200	39
1994	269	27	na	330	205	40
1995	270	28	na	345	206	73
1996	266	30	na	341	212	73
1997	275	31	90	na	213	72

**Sources:** U.S. Army Corps of Engineers, Directorate of Civil Works, Operations, Construction and Readiness Division, Natural Resources Management Branch, Visitation to Corps Recreation Areas, unpublished, Washington, DC, 1997.

U.S Department of Agriculture, Forest Service, *Report of the Forest Service* (USDA, FS, Washington, DC, annual).

U.S. Department of the Interior, Bureau of Land Management, *Public Land Statistics* (DOI, BLM, Washington, DC, annual).

U.S. Department of the Interior, Bureau of Reclamation, Utilization of Recreation Areas on Reclamation Projects, unpublished, Denver, CO, 1994.

U.S. Department of the Interior, Fish and Wildlife Service, Refuge Division, Refuge Management Information System, unpublished, Washington, DC, 1997.

U.S. Department of the Interior, National Park Service, Statistical Office, *National Park Statistical Abstract* (DOI, NPS, Denver, CO, annual).

**Notes:** na = not available. Visitor day = visitor hours divided by 12. Data for Army Corps of Engineers refer to recreation days of use for years 1977 through 1986 and 12-hour visitor days thereafter.

# Ecosystems and Biodiversity

**Table 4.1 Trends in Selected U.S. Resident and Neotropical Migrant Bird Species, 1966-1996, 1966-1979, and 1980-1996**

Common name	Resident/short distance migrant bird species		
	Long-term trend (1966-1996)	Mid-term trend (1966-1979)	Short-term trend (1980-1996)
	..... % change per year .....		
Northern bobwhite	- 2.5	- 1.0	- 3.3
Mourning dove	- 0.3	1.2	- 0.8
Great horned owl	1.1	3.0	- 0.8
Red-headed woodpecker	- 2.2	0.7	- 4.7
Downy woodpecker	- 0.5	0.1	- 1.3
Hairy woodpecker	0.1	1.7	- 0.1
Pileated woodpecker	1.1	1.1	0.8
Red-cockaded woodpecker	- 2.0	8.8	- 8.8
Horned lark	- 1.2	- 0.4	- 1.8
Blue jay	- 1.6	- 1.1	- 1.3
Black-capped chickadee	1.5	1.6	0.1
Carolina chickadee	- 0.9	- 0.8	- 1.7
Tufted titmouse	1.0	- 1.9	2.4
Brown-headed nuthatch	- 2.2	- 2.0	- 2.4
Brown creeper	- 1.5	- 2.6	- 0.9
Carolina wren	0.8	0.0	2.1
Marsh wren	3.9	- 3.1	6.7
Brown thrasher	- 1.1	- 0.9	- 1.1
American robin	0.9	0.7	0.8
Eastern bluebird	2.4	- 4.9	3.9
Northern mockingbird	- 0.9	- 2.0	0.3
Northern cardinal	0.0	- 0.8	0.9
Song sparrow	- 0.1	- 1.9	1.0
Field sparrow	- 3.3	- 5.6	- 2.2
White-throated sparrow	- 1.0	- 2.2	- 0.4
Slate-colored junco	0.0	- 0.5	0.3
Neotropical migrant bird species			
Common name	Long-term trend (1966-1996)	Mid-term trend (1966-1979)	Short-term trend (1980-1996)
	..... % change per year .....		
Yellow-billed cuckoo	- 1.6	3.2	- 3.1
Chuck-will's-widow	- 1.5	- 1.0	- 0.8
Whip-poor-will	- 1.1	- 1.9	- 0.9
Ruby-throated hummingbird	1.5	1.3	2.1
Eastern wood pewee	- 1.6	- 2.1	- 1.2
Least flycatcher	- 1.5	- 2.3	- 0.6
Olive-sided flycatcher	- 4.1	- 2.3	- 3.9
Yellow-bellied flycatcher	0.8	2.7	4.9
Great-crested flycatcher	- 0.1	0.6	0.3

See next page for continuation of table.

**Table 4.1 Trends in Selected U.S. Resident and Neotropical Migrant Bird Species, 1966-1996, 1966-1979, and 1980-1996 (continued)**

Common name	Neotropical migrant bird species		
	Long-term trend (1966-1996)	Mid-term trend (1966-1979)	Short-term trend (1980-1996)
	..... % change per year .....		
Purple martin	- 0.1	3.1	- 2.0
Barn swallow	1.0	4.2	- 1.6
Blue-gray gnatcatcher	1.0	0.8	2.2
Veery	- 1.1	0.8	- 1.6
Wood thrush	- 1.7	0.5	- 1.2
Gray catbird	- 0.2	0.5	0.2
White-eyed vireo	- 0.1	0.2	0.2
Red-eyed vireo	1.1	2.2	1.6
Solitary vireo	3.0	3.4	3.6
Golden-winged warbler	- 2.5	- 3.2	2.1
Tennessee warbler	6.5	8.5	6.5
Northern parula	0.2	0.2	0.2
Cape May warbler	0.9	14.8	- 10.4
Blue-winged warbler	0.5	1.3	0.7
Prairie warbler	- 2.6	- 5.2	- 0.9
Cerulean warbler	- 3.8	- 5.7	- 0.4
Blackpoll warbler	- 3.1	9.6	- 1.8
Chestnut-sided warbler	- 0.3	0.2	0.6
Wilson's warbler	- 0.3	- 1.9	- 2.0
Nashville warbler	0.6	- 2.8	0.7
Kentucky warbler	- 1.0	0.2	- 1.4
American redstart	- 0.5	- 1.2	0.4
Prothonotary warbler	- 1.6	1.0	- 2.2
Ovenbird	1.4	0.7	2.0
Northern waterthrush	0.8	4.7	- 0.5
Louisiana waterthrush	0.3	0.5	- 1.2
Common yellowthroat	- 0.2	0.7	- 0.6
Yellow-breasted chat	- 0.3	- 3.5	1.0
Scarlet tanager	0.1	3.3	- 0.4
Summer tanager	- 0.2	0.2	- 0.5
Baltimore oriole	- 0.4	2.0	- 1.4
Orchard oriole	- 1.8	- 2.6	- 1.0
Rose-breasted grosbeak	0.1	3.3	- 1.3
Indigo bunting	- 0.7	0.1	- 1.0
Grasshopper sparrow	- 3.5	- 4.6	- 1.8
Chipping sparrow	0.0	- 2.1	0.5

**Source:** Sauer, J.R., J.E. Hines, G. Gough, I. Thomas and B.G. Peterjohn, *The North American Breeding Bird Survey Results and Analysis, Version 96.4* (U.S. Department of the Interior, Patuxent Wildlife Research Center, Laurel, MD, 1997).

**Table 4.2 North American Duck Population Estimates, 1955-1997**

Year	Mallard	Gadwall	Am. widgeon	Green wing teal	Blue wing teal	No. shoveler	No. pintail	Red-head	Can-vas-back	Black duck (Atlan)	Black duck (Miss)
..... millions .....											
1955	8.78	0.65	3.22	1.81	5.31	1.64	9.78	0.54	0.59	5.62	0.58
1956	10.45	0.77	3.15	1.53	5.00	1.78	10.37	0.76	0.70	5.99	0.42
1957	9.30	0.67	2.92	1.10	4.30	1.48	6.61	0.51	0.63	5.77	0.42
1958	11.23	0.50	2.55	1.35	5.46	1.38	6.04	0.46	0.75	5.35	0.28
1959	9.02	0.59	3.79	2.65	5.10	1.58	5.87	0.50	0.49	7.04	0.31
1960	7.37	0.78	2.99	1.43	4.29	1.82	5.72	0.50	0.61	4.87	0.34
1961	7.33	0.65	3.05	1.73	3.66	1.38	4.22	0.32	0.44	5.38	0.32
1962	5.54	0.91	1.96	0.72	3.01	1.27	3.62	0.51	0.36	5.29	0.34
1963	6.75	1.06	1.83	1.24	3.72	1.40	3.85	0.41	0.51	5.44	0.33
1964	6.06	0.87	2.59	1.56	4.02	1.72	3.29	0.53	0.64	5.13	0.37
1965	5.13	1.26	2.30	1.28	3.59	1.42	3.59	0.60	0.52	4.64	0.33
1966	6.73	1.68	2.32	1.62	3.73	2.15	4.81	0.71	0.66	4.44	0.30
1967	7.51	1.38	2.33	1.59	4.49	2.31	5.28	0.74	0.50	4.93	0.29
1968	7.09	1.95	2.30	1.43	3.46	1.68	3.49	0.50	0.56	4.41	0.34
1969	7.53	1.57	2.94	1.49	4.14	2.16	5.90	0.63	0.50	5.14	0.33
1970	9.99	1.61	3.47	2.18	4.86	2.23	6.39	0.62	0.58	5.66	0.28
1971	9.42	1.61	3.27	1.89	4.61	2.01	5.85	0.53	0.45	5.14	0.26
1972	9.27	1.62	3.20	1.95	4.28	2.47	6.98	0.55	0.43	8.00	0.27
1973	8.08	1.25	2.88	1.95	3.33	1.62	4.36	0.50	0.62	6.26	0.27
1974	6.88	1.59	2.67	1.86	4.98	2.01	6.60	0.63	0.51	5.78	0.25
1975	7.73	1.64	2.78	1.66	5.89	1.98	5.90	0.83	0.60	6.46	0.24
1976	7.93	1.24	2.51	1.55	4.74	1.75	5.48	0.67	0.61	5.82	0.28
1977	7.40	1.30	2.58	1.29	4.46	1.45	3.93	0.63	0.66	6.26	0.26
1978	7.43	1.56	3.28	2.17	4.50	1.98	5.11	0.72	0.37	5.98	0.27
1979	7.88	1.76	3.11	2.07	4.88	2.41	5.38	0.70	0.58	7.66	0.24
1980	7.71	1.39	3.60	2.05	4.90	1.91	4.51	0.73	0.73	6.38	0.20
1981	6.41	1.40	2.95	1.91	3.72	2.33	3.48	0.59	0.62	5.99	0.24
1982	6.41	1.63	2.46	1.54	3.66	2.15	3.71	0.62	0.51	5.53	0.24
1983	6.46	1.52	2.64	1.88	3.37	1.88	3.51	0.71	0.53	7.17	0.20
1984	5.42	1.52	3.00	1.41	3.98	1.62	2.96	0.67	0.53	7.02	0.23
1985	4.96	1.30	2.05	1.48	3.50	1.70	2.52	0.58	0.38	5.10	0.22
1986	6.12	1.55	1.74	1.67	4.48	2.13	2.74	0.56	0.44	5.24	0.23
1987	5.79	1.31	2.01	2.01	3.53	1.95	2.63	0.50	0.45	4.86	0.20
1988	6.37	1.35	2.21	2.06	4.01	1.68	2.01	0.44	0.44	4.67	0.23
1989	5.65	1.41	1.97	1.84	3.13	1.54	2.11	0.51	0.48	4.34	0.24
1990	5.45	1.67	1.86	1.79	2.78	1.76	2.26	0.48	0.54	4.29	0.23
1991	5.44	1.58	2.25	1.56	3.76	1.72	1.80	0.45	0.49	5.25	0.23
1992	5.98	2.03	2.21	1.77	4.33	1.95	2.10	0.60	0.48	4.64	0.20
1993	5.71	1.76	2.05	1.69	3.19	2.05	2.05	0.49	0.47	4.08	0.21
1994	6.98	2.32	2.38	2.11	4.62	2.91	2.97	0.65	0.53	4.53	0.22
1995	8.27	2.84	2.61	2.30	5.14	2.85	2.76	0.89	0.77	4.45	0.21
1996	7.94	2.98	2.27	2.50	6.41	3.45	2.74	0.83	0.85	4.22	0.20
1997	9.94	3.90	3.12	2.51	6.12	4.12	3.56	0.92	0.69	4.11	0.20

**Source:** U.S. Department of the Interior, Fish and Wildlife Service, Office of Migratory Bird Management in Conjunction with the Canadian Wildlife Service, *Status of Waterfowl and Fall Flight Forecast* (DOI, FWS, Washington, DC, annual).

**Table 4.3 North American Goose and Swan Population Estimates, 1969-1997**

Year	Canada goose	Snow goose	Greater white-fronted goose	Brant	Emperor goose	Tundra swan	
	..... millions .....	.....	.....	.....	..... thousands .....	Eastern	Western
1969/70	0.244	0.908	na	141.7	na	31.0	55.0
1970/71	0.367	1.191	na	300.2	na	98.8	58.2
1971/72	0.550	1.467	na	197.8	na	82.8	63.4
1972/73	0.648	1.180	na	166.0	na	33.9	57.2
1973/74	0.536	1.371	na	218.7	na	69.7	64.2
1974/75	0.535	1.277	na	211.4	na	54.3	66.6
1975/76	0.810	1.751	na	249.0	na	51.4	78.6
1976/77	0.727	1.344	na	221.0	na	47.3	76.2
1977/78	0.724	2.191	na	208.9	na	45.6	70.3
1978/79	0.604	1.485	na	173.4	na	53.5	78.6
1979/80	0.610	1.598	73.1	215.4	na	65.2	63.7
1980/81	0.923	1.615	93.5	291.2	93.3	83.6	93.0
1981/82	1.027	2.007	116.5	227.0	100.6	91.3	73.1
1982/83	1.024	1.974	91.7	233.3	79.2	67.3	87.0
1983/84	0.859	1.763	112.9	260.4	71.2	61.9	81.1
1984/85	1.012	2.275	100.2	290.8	58.8	48.8	94.3
1985/86	0.925	1.808	93.8	246.2	42.0	66.2	90.9
1986/87	1.148	2.232	107.1	219.9	51.7	52.8	94.5
1987/88	1.307	1.797	130.6	278.0	53.8	59.2	77.4
1988/89	2.482	2.387	161.5	273.2	45.8	78.7	90.6
1989/90	2.615	2.131	218.8	287.0	67.6	40.1	89.7
1990/91	2.238	2.589	240.8	279.4	70.9	47.6	97.4
1991/92	3.280	2.550	236.5	302.5	71.3	63.7	110.1
1992/93	2.885	2.288	853.8	225.0	52.5	62.6	76.6
1993/94	3.314	2.877	971.4	287.2	57.3	79.4	84.5
1994/95	3.829	3.488	1,052.1	281.9	51.2	52.9	81.3
1995/96	3.721	3.160	1,406.9	232.8	80.3	98.1	79.0
1996/97	4.577	3.636	1,086.6	279.4	57.1	122.5	86.1

**Source:** U.S. Department of the Interior, Fish and Wildlife Service, Office of Migratory Bird Management in Conjunction with the Canadian Wildlife Service, *Status of Waterfowl and Fall Flight Forecast* (DOI, FWS, Washington, DC, annual).

**Notes:** na = not available. Data for Canada goose are aggregate population totals for 13 separate populations that nest in North America. Data for snow goose are aggregate population totals for the greater snow goose, lesser snow goose, and Ross' goose populations. The 1994/95 survey of the western tundra swan population was incomplete.

**Table 4.4 Status of Marine Mammal Stocks in U.S. Waters, 1995**

Species	Stock area	Marine Mammals of the Pacific			Total annual mortality	Trend
		Nmin	PBR			
Sperm whale	CA/OR/WA	511	1.0	15	S	
Humpback whale	CA/Mexico	563	0.5	1	I	
Blue whale	CA/Mexico	1,708	1.7	1	I	
Fin whale	CA/WA	575	1.1	1	I	
Brydes whale	E. Trop. Pacific	11,145	0.5	na	U	
Sei whale	E. North Pacific	na	na	na	U	
Minke whale	CA/WA	265	2.6	0.5	U	
Harbor porpoise	Central CA	3,430	34	31	D	
Harbor porpoise	N. California	7,649	76	0	S	
Harbor porpoise	OR/WA	22,049	220	14.2	U	
Harbor porpoise	Inland WA	2,680	27	15	D	
Dall's porpoise	CA/WA	58,902	589	36	U	
Pacific white-sided dolphin	CA/WA	82,939	829	28	S	
Risso's dolphin	CA/WA	22,388	224	39	U	
Bottlenose dolphin	CA coastal	245	2.5	0	S	
Bottlenose dolphin	CA/WA offshore	1,775	18	8	U	
Striped dolphin	California	13,639	136	0	U	
Common dolphin (short-beaked)	CA/WA	1,798,185	1,792	316	I	
Common dolphin (long-beaked)	California	5,636	56	23	U	
No. right whale dolphin	CA/WA	15,080	151.0	46	U	
Killer whale	CA/WA	139	1.4	0	U	
Pilot whale (short-finned)	CA/WA	na	na	36	U	
Baird's beaked whale	CA/WA	19	0.2	2	U	
Mesoplodont beaked whale	CA/WA	136	1.4	8	U	
Cuvier's beaked whale	CA/WA	886	9.0	24	U	
Pygmy sperm whale	CA/WA	481	4.8	6	U	
Dwarf sperm whale	CA/WA	na	na	0	U	
Brydes whale	Hawaii	na	na	0	U	
Blue whale	Hawaii	na	na	0	U	
Fin whale	Hawaii	na	na	0	U	

See next page for continuation of table.

**Table 4.4 Status of Marine Mammal Stocks in U.S. Waters, 1995  
(continued)**

Species	Stock area	Marine Mammals of the Pacific			Total annual mortality	Trend
		Nmin	PBR			
Pygmy killer whale	Hawaii	na	na	na	na	U
Pilot whale (short finned)	Hawaii	na	na	na	na	U
Risso's dolphin	Hawaii	na	na	na	na	U
Killer whale	Hawaii	na	na	0.0	0.0	U
Melon-headed whale	Hawaii	na	na	0.0	0.0	U
False killer whale	Hawaii	na	na	na	na	U
Pantropical spotted dolphin	Hawaii	na	na	na	na	U
Stripped dolphin	Hawaii	na	na	na	na	U
Spinner dolphin	Hawaii	677	6.8	1.0	1.0	U
Rough-toothed dolphin	Hawaii	na	na	na	na	U
Bottlenose dolphin	Hawaii	na	na	0.0	0.0	U
Pygmy sperm whale	Hawaii	na	na	na	na	U
Dwarf sperm whale	Hawaii	na	na	0.0	0.0	U
Sperm whale	Hawaii	na	na	na	na	U
Cuvier's beaked whale	Hawaii	na	na	0.0	0.0	U
Blainville's beaked whale	Hawaii	na	na	0.0	0.0	U
California sea lion	U.S.	84,195	5,052	2,434	I	
Harbor seal	California	32,800	1,968	729	I	
Harbor seal	WA inland	13,053	783	14	I	
Harbor seal	OR/WA	28,322	850	233	I	
Northern elephant seal	CA breeding	42,000	1,743	166	I	
Northern fur seal	San Miguel Is.	10,536	227	0	I	
Guadalupe fur seal	Mexico to CA	3,028	104	0	I	
Hawaiian monk seal	Hawaii	1,300	4.6	1	D	
NE spotted dolphin	E. Trop. Pacific	648,900	6,489	934	D	
W/S offshore spotted dolphin	E. Trop. Pacific	1,145,100	11,451	1,226	S	
Eastern spinner dolphin	E. Trop. Pacific	518,500	5,185	743	S	
Whitebelly spinner dolphin	E. Trop. Pacific	872,000	8,720	619	S	
Common dolphin (northern)	E. Trop. Pacific	3,531,000	3,531	101	S	
Common dolphin (central)	E. Trop. Pacific	297,400	2,974	151	S	
Common dolphin (southern)	E. Trop. Pacific	1,845,600	18,456	0	S	
Stripped dolphin	E. Trop. Pacific	1,745,900	17,459	11	S	
Coastal spotted dolphin	E. Trop. Pacific	22,500	225	na	S	
Central Am. spinner dolphin	E. Trop. Pacific	na	na	11	S	
Sea otter	Central CA	na	na	na	I	
Sea otter	WA	na	na	na	I	

See next page for continuation of table.

**Table 4.4 Status of Marine Mammal Stocks in U.S. Waters, 1995  
(continued)**

Marine Mammals of the Atlantic and Gulf of Mexico					
Species	Stock area	Nmin	PBR	Total annual mortality	Trend
No. Atlantic right whale	W. No. Atlantic	395	0.4	2.5	I
Humpback whale	W. No. Atlantic	4,848	9.7	1	U
Fin whale	W. No. Atlantic	1,704	3.4	na	U
Sei whale	W. No. Atlantic	155	0.3	0.3	U
Minke whale	E. Coast Canada	2,053	21.0	2.5	U
Blue whale	W. No. Atlantic	na	na	0.0	U
Sperm whale	W. No. Atlantic	226	0.5	1.6	U
Dwarf sperm whale	W. No. Atlantic	na	na	na	U
Pygmy sperm whale	W. No. Atlantic	na	na	na	U
Killer whale	W. No. Atlantic	na	na	0	U
Pygmy killer whale	W. No. Atlantic	6	0.1	0	U
Northern bottlenose whale	W. No. Atlantic	na	na	0	U
Cuvier's beaked whale	W. No. Atlantic	na	na	34	U
True's beaked whale	W. No. Atlantic	na	na	34	U
Gervais beaked whale	W. No. Atlantic	na	na	34	U
Blainville's beaked whale	W. No. Atlantic	na	na	34	U
Sowerby's beaked whale	W. No. Atlantic	na	na	34	U
Risso's dolphin	W. No. Atlantic	11,140	111	68	U
Pilot whale (long-finned)	W. No. Atlantic	3,537	28	109	U
Pilot whale (short-finned)	W. No. Atlantic	457	3.7	109	U
Atlantic white-sided dolphin	W. No. Atlantic	12,538	125	127	U
White-beaked dolphin	W. No. Atlantic	na	na	0.0	U
Common dolphin	W. No. Atlantic	3,233	32	449	U
Atlantic spotted dolphin	W. No. Atlantic	4,885	9.8	31	U
Pantropical spotted dolphin	W. No. Atlantic	na	na	31	U
Stripped dolphin	W. No. Atlantic	9,165	73	63	U
Spinner dolphin	W. No. Atlantic	na	na	1.0	U
Bottlenose dolphin	Mid-Atl. offshore	9,195	92	128	U
Bottlenose dolphin	Mid-Atl. coastal	2,482	25	29	S
Harbor porpoise	Gulf of Maine*	40,279	403	1,876	U
Harbor seal	W. No. Atlantic	28,810	1,729	476	I
Gray seal	N. W. No. Atlantic	2,035	122	4.5	I
Harp seal	N. W. No. Atlantic	na	na	0	I
Hooded seal	N. W. No. Atlantic	na	na	0	I
Sperm whale	N. Gulf of Mexico	411	0.8	0	U
Bryde's whale	N. Gulf of Mexico	17	0.2	0	U
Cuvier's beaked whale	N. Gulf of Mexico	20	0.2	0	U
Blainville's beaked whale	N. Gulf of Mexico	na	na	0	U
Gervais' beaked whale	N. Gulf of Mexico	na	na	0	U
Bottlenose dolphin	G. of Mexico OCS	43,233	432	5	U
Bottlenose dolphin	G. of Mexico S&S	4,530	45	5	U
Bottlenose dolphin	W. G. of Mexico coast	2,938	29	13	U
Bottlenose dolphin	E. G. of Mexico coast	8,963	90	8	U
Bottlenose dolphin	G. of Mexico inland**	na	39.7	30	U

See next page for continuation of table.

**Table 4.4 Status of Marine Mammal Stocks in U.S. Waters, 1995  
(continued)**

Marine Mammals of the Atlantic and Gulf of Mexico					
Species	Stock area	Nmin	PBR	Total annual mortality	Trend
Atlantic spotted dolphin	N. Gulf of Mexico	2,555	23	1.5	U
Pantropical spotted dolphin	N. Gulf of Mexico	26,510	265	1.5	U
Stripped dolphin	N. Gulf of Mexico	3,409	34	0	U
Spinner dolphin	N. Gulf of Mexico	4,465	45	0	U
Rough-toothed dolphin	N. Gulf of Mexico	660	6.6	0	U
Clymene dolphin	N. Gulf of Mexico	4,120	41	0	U
Fraser's dolphin	N. Gulf of Mexico	66	0.7	0	U
Killer whale	N. Gulf of Mexico	197	2	0	U
False killer whale	N. Gulf of Mexico	236	2.4	0	U
Pygmy killer whale	N. Gulf of Mexico	285	2.8	0	U
Dwarf sperm whale	N. Gulf of Mexico	na	na	0	U
Pygmy sperm whale	N. Gulf of Mexico	na	na	0	U
Melon-headed whale	N. Gulf of Mexico	2,888	29	0	U
Risso's dolphin	N. Gulf of Mexico	2,199	22	19	U
Pilot whale (short-finned)	N. Gulf of Mexico	186	1.9	0.3	U
West Indian manatee	Florida	na	na	na	D
West Indian manatee	Antillean	na	na	na	D

**Source:** U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, *Our Living Oceans, Report on the Status of U.S. Living Marine Resources, 1995*, NOAA Technical Memorandum NMFS-F/SPO-19 (DOC, NOAA, NMFS, Washington, DC, 1996).

**Notes:** N<sub>min</sub> = minimum population. PBR = potential biological removal. Trend is increasing (I), decreasing (D), stable (S), and unknown (U). na = not available. \*Also includes the Bay of Fundy. \*\*Represents at least 33 individually recognized stocks of bottlenose dolphin in U.S. Gulf of Mexico bays, sounds, and other estuaries. OCS = Outer Continental Shelf. S&S = Shelf and Slope. The following marine mammals in the Pacific have Endangered Species Act status: sperm whale (endangered); humpback whale (endangered), blue whale (both CA/Mexico and Hawaii stocks) (endangered), fin whale (both CA/WA and Hawaii stocks) (endangered), sei whale (endangered), Guadalupe fur seal (threatened); and Hawaiian monk seal (endangered). Two species of marine mammals in the Pacific have Marine Mammal Protection Act status: northeastern spotted dolphin (depleted) and eastern spinner dolphin (depleted). Nine species of marine mammals in the Atlantic and Gulf of Mexico have Endangered Species Act status: North Atlantic right whale (endangered); humpback whale (endangered); fin whale (endangered); sei whale (endangered); blue whale (endangered); W. North Atlantic sperm whale (endangered); Gulf of Mexico sperm whale (endangered); Florida West Indian manatee (endangered); and Antillean West Indian manatee (endangered). One marine mammal species in the Atlantic and Gulf of Mexico has Marine Mammal Protection Act status: Mid-Atlantic coastal bottlenose dolphin (depleted).

**Table 4.5 Status of Sea Turtle Stocks in U.S. Waters, 1998**

Region/ Species	Location of principal nesting population	Historic number of females nesting annually	Current number of nesting females	Trend in U.S. nesting population <sup>1</sup>	Status in the United States	Foot- notes
<b>Atlantic</b>						
Loggerhead	SE U.S.	Unknown	10,502	Stable	T	2
Green	Florida	Unknown	675	Increasing	T,E	3
Kemp's ridley	Mexico	>40,000	954	Increasing	E	4
Leatherback	Florida, USVI, PR	Unknown	160	Stable	E	5
Hawksbill	USVI, PR	Unknown	367	Unknown	E	6
<b>Pacific</b>						
Loggerhead	Japan	Unknown	1,000	Stable	T	7
Green	Hawaii	Unknown	1,000	Increasing	T	8
Olive ridley	Mexico, Costa Rica	Unknown	350,000	Increasing	T	9
Leatherback	Mexico, Costa Rica	Unknown	985	Decreasing	E	10
Hawksbill	Hawaii	Unknown	30-40	Stable	E	11

**Source:** U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, *Our Living Oceans, Report on the Status of U.S. Living Marine Resources, 1995*, NOAA Technical Memorandum NMFS-F/SPO-19 (DOC, NOAA, NMFS, Washington, DC, 1996), with updates by agency.

**Notes:** E = Listed as Endangered under the Endangered Species Act. T = Listed as Threatened under the Endangered Species Act. <sup>1</sup>Unless principal population is outside U.S. jurisdiction. <sup>2</sup>Average number of females nesting annually based on 4.1 nests per female per year for 1989-1995. <sup>3</sup>Average number of females nesting annually based on 3.5 nests per female per year for 1993-1997. <sup>4</sup>Number of females nesting in 1997 based on 2.5 nests per female per year. <sup>5</sup>Average number of females nesting annually based on 5.3 nests per female per year for 1993-1997 for Florida, Sandy Point (USVI), and Culebra Island (PR). <sup>6</sup>Average number of females nesting annually based on 4.5 nests per female per year for 1994-1998 for Mona Island (PR). Nesting also occurs at other PR and USVI beaches. <sup>7</sup>Estimated aggregate 1995 nesting population based on surveys of principal nesting beaches. <sup>8</sup>Estimated total Hawaiian nesting population based on doubling results of 1997 East Island survey. Despite growth in nesting population, concern remains over increasing incidence of fibropapillomatosis. <sup>9</sup>Estimated number of nesters at La Escobilla beach, Oaxaca, in 1996. Nesting also occurs at other Mexican beaches. <sup>10</sup>Based on estimated 5,222 nests in 1996 on principal nesting beaches. <sup>11</sup>Based on recent nesting beach surveys through 1997 by USFWS.

**Table 4.6 U.S. Threatened and Endangered Species, 1980-1997**

Year	Threatened animal species by taxonomic group										Threatened plant species	Total
	Mammals	Birds	Reptiles	Amphibians	Fish	Crustaceans	Snails	Insects	Arachnids	Clams		
..... number of species .....										.....		
1980	4	3	12	3	14	0	5	7	0	0	9	57
1981	4	3	12	3	14	0	5	6	0	0	10	57
1982	4	3	12	3	14	1	5	6	0	0	10	58
1983	4	3	12	3	15	1	5	6	0	0	11	60
1984	5	3	12	3	18	1	5	5	0	0	11	63
1985	5	4	12	3	24	1	5	5	0	0	25	84
1986	6	4	14	3	28	1	5	7	0	0	27	95
1987	6	9	17	4	32	1	5	7	0	0	35	116
1988	6	9	17	4	31	1	5	7	0	0	48	128
1989	7	9	17	5	32	1	6	7	0	0	51	135
1990	8	11	17	5	33	2	6	9	0	2	61	154
1991	8	11	17	5	34	2	6	9	0	2	64	159
1992	9	12	18	5	36	2	7	9	0	2	74	174
1993	9	16	19	5	37	2	7	9	0	3	80	187
1994	9	16	19	5	39	3	7	9	0	3	90	200
1995	9	16	19	5	39	3	7	9	0	6	93	206
1996	9	16	19	6	40	3	7	9	0	6	101	216
1997	7	15	20	7	41	3	7	9	0	6	115	230
..... number of species .....										.....		
Year	Endangered animal species by taxonomic group										Endangered plant species	Total
	Mammals	Birds	Reptiles	Amphibians	Fish	Crustaceans	Snails	Insects	Arachnids	Clams		
..... number of species .....										.....		
1980	32	58	13	5	33	1	2	7	0	23	50	223
1981	32	58	13	5	33	1	3	7	0	23	51	225
1982	32	58	14	5	35	2	3	7	0	23	57	235
1983	35	53	14	5	34	3	3	7	0	23	58	234
1984	37	66	14	5	33	3	3	8	0	22	71	261
1985	43	68	14	5	40	3	3	8	0	23	93	299
1986	43	71	14	5	42	4	3	8	0	23	114	326
1987	46	73	15	5	42	5	3	8	0	28	139	362
1988	50	72	15	5	46	8	3	11	4	31	153	397
1989	51	72	15	6	50	8	3	12	4	34	166	420
1990	53	72	15	6	53	8	3	12	4	37	179	441
1991	56	72	15	6	54	8	7	14	4	40	238	513
1992	56	72	15	6	55	9	11	16	4	40	295	578
1993	56	72	14	6	61	11	12	17	4	50	323	626
1994	57	74	14	7	66	14	15	19	4	51	420	741
1995	57	75	14	7	66	14	15	20	5	51	432	756
1996	57	74	14	7	67	14	15	20	5	51	513	837
1997	58	75	14	9	67	16	15	28	5	56	553	896
..... number of species .....										.....		

**Source:** U.S. Department of the Interior, Fish and Wildlife Service, *Endangered Species Bulletin* (DOI, FWS, Washington, DC, bimonthly).

**Note:** Data are year-end cumulative totals.

# Air Quality

**Table 5.1 U.S. Emissions of Carbon Monoxide by Source, Ten-Year Intervals, 1940-1980, and Annually, 1988-1997**

Year	Industrial processes							Total industrial
	Chemical industries	Metals processing	Petro-leum industries	Other industries	Solvent utilization	Storage and trans-port	Waste disposal and recycling	
	million tons							
1940	4.190	2.750	0.221	0.114	na	na	3.630	10.905
1950	5.844	2.910	2.651	0.231	na	na	4.717	16.353
1960	3.982	2.866	3.086	0.342	na	na	5.597	15.873
1970	3.397	3.644	2.179	0.620	na	na	7.059	16.899
1980	2.151	2.246	1.723	0.830	na	na	2.300	9.250
1988	1.917	2.101	0.441	0.711	0.002	0.056	1.806	7.034
1989	1.925	2.132	0.436	0.716	0.002	0.055	1.747	7.013
1990	1.183	2.640	0.333	0.537	0.005	0.076	1.079	5.853
1991	1.127	2.571	0.345	0.548	0.005	0.028	1.116	5.740
1992	1.112	2.496	0.371	0.544	0.005	0.017	1.138	5.683
1993	1.093	2.536	0.371	0.594	0.005	0.051	1.248	5.898
1994	1.171	2.475	0.338	0.600	0.005	0.024	1.225	5.839
1995	1.223	2.380	0.348	0.624	0.006	0.025	1.185	5.791
1996	1.223	2.378	0.348	0.635	0.006	0.025	1.203	5.818
1997	1.287	2.465	0.364	0.663	0.006	0.026	1.242	6.052
Year	Fuel combustion							Total all sources
	Electric utilities	Industrial	Other	Total	On-road vehicles	Non-road sources	Miscellaneous	
	million tons							
1940	0.004	0.435	14.890	15.329	30.121	8.051	29.210	93.615
1950	0.110	0.549	10.656	11.315	45.196	11.610	18.135	102.609
1960	0.110	0.661	6.250	7.021	64.266	11.575	11.010	109.745
1970	0.237	0.770	3.625	4.632	88.034	11.287	7.909	128.761
1980	0.322	0.750	6.230	7.302	78.049	13.758	8.344	116.702
1988	0.314	0.669	6.390	7.373	71.081	14.698	15.895	116.081
1989	0.321	0.672	6.450	7.443	66.050	14.820	8.154	103.480
1990	0.363	0.879	4.268	5.510	57.848	15.376	11.208	95.794
1991	0.349	0.920	4.587	5.856	62.074	15.368	8.751	97.790
1992	0.350	0.955	4.849	6.154	59.859	15.652	7.052	94.400
1993	0.362	1.043	4.180	5.585	60.202	15.828	7.013	94.526
1994	0.370	1.041	4.108	5.519	61.833	16.050	9.613	98.854
1995	0.372	1.056	4.506	5.934	54.106	16.271	7.049	89.151
1996	0.394	1.072	4.513	5.980	52.944	16.409	9.462	90.611
1997	0.406	1.110	3.301	4.817	50.257	16.755	9.680	87.451

**Source:** U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *National Air Pollutant Emissions Trends Report, 1970-1997*, Table A-1 (EPA, OAQPS, Research Triangle Park, NC, 1998), and earlier reports in this series.

**Notes:** na = not available. Non-road sources include non-road gasoline engines (e.g., industrial, lawn and garden, light commercial, and recreational marine vessels), non-road diesel (e.g., construction and farm), aircraft, and railroads. Miscellaneous includes agricultural fires, slash/prescribed burning, and forest wildfires.

**Table 5.2 U.S. Emissions of Nitrogen Oxides by Source, Ten-Year Intervals, 1940-1980, and Annually, 1988-1997**

Year	Industrial processes							Total industrial
	Chemical industries	Metals processing	Petro-leum industries	Other industries	Solvent utilization	Storage and transport	Waste disposal and recycling	
	million tons							
1940	0.006	0.004	0.105	0.107	na	na	0.110	0.332
1950	0.063	0.110	0.110	0.093	na	na	0.215	0.591
1960	0.110	0.110	0.220	0.131	na	na	0.331	0.902
1970	0.271	0.077	0.240	0.187	na	na	0.440	1.215
1980	0.213	0.065	0.072	0.205	na	na	0.111	0.669
1988	0.274	0.087	0.100	0.315	0.003	0.002	0.085	0.860
1989	0.273	0.083	0.097	0.311	0.003	0.002	0.084	0.852
1990	0.168	0.097	0.153	0.378	0.001	0.003	0.091	0.892
1991	0.165	0.076	0.121	0.352	0.002	0.006	0.095	0.816
1992	0.163	0.081	0.148	0.361	0.003	0.005	0.096	0.857
1993	0.155	0.083	0.123	0.370	0.003	0.005	0.123	0.861
1994	0.160	0.091	0.117	0.389	0.003	0.005	0.114	0.878
1995	0.158	0.098	0.110	0.399	0.003	0.006	0.099	0.873
1996	0.159	0.098	0.110	0.403	0.003	0.006	0.100	0.879
1997	0.167	0.102	0.115	0.421	0.003	0.006	0.103	0.917
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Year	Fuel combustion				Non-road sources	Miscel-laneous	Total all sources	
	Electric utilities	Indus-trial	Other	Total	On-road vehicles			
	million tons							
1940	0.660	2.543	0.529	3.732	1.330	0.991	0.990	7.374
1950	1.316	3.192	0.647	5.155	2.143	1.538	0.665	10.093
1960	2.536	4.075	0.760	7.371	3.982	1.443	0.441	14.140
1970	4.900	4.325	0.836	10.061	7.390	2.182	0.330	21.179
1980	7.024	3.555	0.741	11.318	8.621	4.011	0.248	24.866
1988	6.545	3.187	0.740	10.472	7.661	3.998	0.727	23.718
1989	6.593	3.209	0.736	10.538	7.682	4.049	0.293	23.414
1990	6.663	3.035	1.196	10.895	7.040	4.237	0.371	23.436
1991	6.519	2.979	1.281	10.779	7.373	4.265	0.286	23.520
1992	6.504	3.071	1.353	10.928	7.440	4.310	0.254	23.789
1993	6.651	3.151	1.308	11.111	7.510	4.339	0.225	24.046
1994	6.565	3.147	1.303	11.015	7.672	4.397	0.383	24.345
1995	6.384	3.144	1.298	10.828	7.323	4.507	0.237	23.768
1996	6.060	3.170	1.289	10.519	7.245	4.478	0.343	23.465
1997	6.178	3.270	1.276	10.724	7.035	4.560	0.346	23.582

**Source:** U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *National Air Pollutant Emissions Trends Report, 1970-1997*, Table A-2 (EPA, OAQPS, Research Triangle Park, NC, 1998), and earlier reports in this series.

**Notes:** na = not available. Non-road sources include non-road gasoline engines, non-road diesel (e.g., construction and farm), aircraft, marine vessels, and railroads. Miscellaneous is not defined by the Source.

**Table 5.3 U.S. Emissions of Volatile Organic Compounds by Source, Ten-Year Intervals, 1940-1980, and Annually, 1988-1997**

Year	Industrial processes							Total industrial
	Chemical industries	Metals processing	Petro- leum indus- ties	Other indus- tries	Solvent utili- zation	Storage and trans- port	Waste disposal and recycling	
	million tons							
1940	0.884	0.325	0.571	0.130	1.971	0.639	0.990	5.510
1950	1.324	0.442	0.548	0.184	3.679	1.218	1.104	8.499
1960	0.991	0.342	1.034	0.202	4.403	1.762	1.546	10.280
1970	1.341	0.394	1.194	0.270	7.174	1.954	1.984	14.311
1980	1.595	0.273	1.440	0.237	6.584	1.975	0.758	12.861
1988	0.982	0.074	0.645	0.408	5.945	1.842	0.959	10.853
1989	0.980	0.074	0.639	0.403	5.964	1.753	0.941	10.755
1990	0.634	0.122	0.612	0.401	5.750	1.495	0.986	10.000
1991	0.710	0.123	0.640	0.391	5.782	1.532	0.999	10.178
1992	0.715	0.124	0.632	0.414	5.901	1.583	1.010	10.380
1993	0.701	0.124	0.649	0.442	6.016	1.600	1.046	10.578
1994	0.691	0.126	0.647	0.438	6.162	1.629	1.046	10.738
1995	0.660	0.125	0.642	0.450	6.183	1.652	1.067	10.780
1996	0.436	0.070	0.517	0.439	6.273	1.312	0.433	9.482
1997	0.458	0.073	0.538	0.458	6.483	1.377	0.449	9.836
Year	Fuel combustion							Total all sources
	Electric utilities	Indus- trial	Other	Total	On-road vehicles	Non- road sources	Miscel- laneous	
	million tons							
1940	0.002	0.108	1.867	1.977	4.817	0.778	4.079	17.161
1950	0.009	0.098	1.336	1.443	7.251	1.213	2.530	20.936
1960	0.009	0.106	0.768	0.883	10.506	1.215	1.573	24.459
1970	0.030	0.150	0.541	0.694	12.972	1.644	1.101	30.748
1980	0.045	0.157	0.848	1.050	8.979	2.141	1.134	26.166
1988	0.037	0.136	1.188	1.360	8.290	2.293	1.230	24.027
1989	0.037	0.134	1.200	1.372	7.192	2.314	0.642	22.274
1990	0.047	0.182	0.776	1.005	6.313	2.452	1.164	20.935
1991	0.044	0.196	0.835	1.075	6.499	2.466	0.845	21.063
1992	0.044	0.187	0.884	1.114	6.072	2.498	0.579	20.642
1993	0.045	0.186	0.762	0.993	6.103	2.516	0.641	20.830
1994	0.045	0.196	0.748	0.989	6.401	2.538	0.798	21.465
1995	0.044	0.206	0.823	1.073	5.701	2.405	0.600	20.558
1996	0.049	0.208	0.822	1.079	5.490	2.397	0.846	19.293
1997	0.051	0.217	0.593	0.861	5.230	2.430	0.858	19.214

**Source:** U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *National Air Pollutant Emissions Trends Report, 1970-1997*, Table A-3 (EPA, OAQPS, Research Triangle Park, NC, 1998), and earlier reports in this series.

**Notes:** Non-road sources include non-road gasoline engines (e.g., lawn and garden and recreational marine vessels), non-road diesel (e.g., construction and farm), and aircraft. Miscellaneous includes fires, other combustion and natural geogenic sources. The latter accounted for 0.014 million tons each year 1990-1997 (data not available for other years).

**Table 5.4 U.S. Emissions of Sulfur Dioxide by Source, Ten-Year Intervals, 1940-1980, and Annually, 1988-1997**

Year	Industrial processes							Total industrial
	Chemical industries	Metals processing	Petro-leum industries	Other industries	Solvent utilization	Storage and transport	Waste disposal and recycling	
	million tons							
1940	0.215	3.309	0.224	0.334	na	na	0.003	4.085
1950	0.427	3.747	0.340	0.596	na	na	0.003	5.113
1960	0.447	3.986	0.676	0.671	na	na	0.010	5.790
1970	0.591	4.775	0.881	0.846	na	na	0.008	7.100
1980	0.280	1.842	0.734	0.918	na	na	0.033	3.773
1988	0.449	0.707	0.443	0.411	0.001	0.005	0.036	2.052
1989	0.440	0.695	0.429	0.405	0.001	0.005	0.036	2.010
1990	0.297	0.726	0.430	0.399	0.000	0.007	0.042	1.900
1991	0.280	0.612	0.378	0.396	0.000	0.010	0.044	1.721
1992	0.278	0.615	0.416	0.396	0.001	0.009	0.044	1.758
1993	0.269	0.603	0.383	0.392	0.001	0.005	0.071	1.723
1994	0.275	0.562	0.379	0.398	0.001	0.002	0.060	1.676
1995	0.286	0.530	0.369	0.403	0.001	0.002	0.047	1.637
1996	0.287	0.530	0.368	0.409	0.001	0.002	0.048	1.644
1997	0.301	0.552	0.385	0.427	0.001	0.002	0.050	1.718
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Year	Fuel combustion				Non-road sources	Miscel-laneous	Total all sources	
	Electric utilities	Indus-trial	Other	Total	On-road vehicles			
	million tons							
1940	2.427	6.060	3.642	12.129	0.003	3.190	0.545	19.953
1950	4.515	5.725	3.964	14.204	0.103	2.392	0.545	22.358
1960	9.264	3.864	2.319	15.447	0.114	0.321	0.554	22.227
1970	17.398	4.568	1.490	23.456	0.411	0.083	0.110	31.161
1980	17.469	2.951	0.971	21.391	0.521	0.175	0.011	25.905
1988	15.987	3.111	0.660	19.758	0.553	0.764	0.027	23.154
1989	16.215	3.086	0.624	19.923	0.570	0.794	0.011	23.308
1990	15.909	3.550	0.831	20.290	0.542	0.934	0.012	23.678
1991	15.784	3.256	0.755	19.795	0.570	0.958	0.011	23.056
1992	15.416	3.292	0.784	19.492	0.578	0.980	0.010	22.818
1993	15.189	3.284	0.772	19.244	0.517	0.982	0.009	22.476
1994	14.889	3.218	0.780	18.886	0.301	1.000	0.015	21.879
1995	12.080	3.357	0.793	16.229	0.304	1.008	0.009	19.189
1996	12.632	3.399	0.782	16.814	0.316	1.026	0.013	19.812
1997	13.082	3.365	0.813	17.260	0.320	1.060	0.013	20.369

**Source:** U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *National Air Pollutant Emissions Trends Report, 1970-1997*, Table A-4 (EPA, OAQPS, Research Triangle Park, NC, 1998), and earlier reports in this series.

**Notes:** na = not available. Non-road sources include marine vessels and railroads. Miscellaneous include fugitive dust and other combustion.

**Table 5.5 U.S. Emissions of Particulate Matter (PM-10) by Source, Ten-Year Intervals, 1940-1980, and Annually, 1988-1997**

Year	Industrial processes							Total indus- trial
	Chem- ical indus- tries	Metals pro- cessing	Petro- leum indus- ties	Other indus- ries	Sol- vent utili- zation	Storage and trans- port	Waste disposal and recycling	
	million tons							
1940	0.330	1.208	0.366	3.996	na	na	0.392	6.292
1950	0.455	1.027	0.412	6.954	na	na	0.505	9.353
1960	0.309	1.026	0.689	7.211	na	na	0.764	9.999
1970	0.235	1.316	0.286	5.832	na	na	0.999	8.668
1980	0.148	0.622	0.138	1.846	na	na	0.273	3.027
1988	0.062	0.208	0.060	0.601	0.002	0.101	0.259	1.000
1989	0.063	0.211	0.058	0.591	0.002	0.101	0.251	1.276
1990	0.077	0.214	0.055	0.583	0.004	0.102	0.271	1.306
1991	0.068	0.251	0.043	0.520	0.005	0.101	0.276	1.264
1992	0.071	0.250	0.043	0.506	0.005	0.117	0.278	1.269
1993	0.066	0.181	0.038	0.501	0.006	0.114	0.334	1.240
1994	0.076	0.184	0.038	0.495	0.006	0.106	0.313	1.219
1995	0.067	0.212	0.040	0.511	0.006	0.109	0.287	1.231
1996	0.067	0.211	0.040	0.510	0.006	0.109	0.290	1.232
1997	0.070	0.220	0.041	0.530	0.006	0.114	0.296	1.277
Year	Fuel combustion							Total all sources
	Electric utilities	Indus- trial	Other	Total	On-road vehicles	Non- road sources	Miscel- laneous	
	million tons							
1940	0.962	0.708	2.338	4.008	0.210	2.480	(1)	15.956
1950	1.467	0.604	1.674	3.745	0.314	1.788	(1)	17.133
1960	2.117	0.331	1.113	3.561	0.554	0.201	(1)	15.558
1970	1.775	0.641	0.455	2.871	0.443	0.255	(1)	13.190
1980	0.879	0.679	0.887	2.445	0.397	0.566	(1)	7.287
1988	0.276	0.244	0.862	1.381	0.369	0.483	(1)	4.000
1989	0.271	0.243	0.869	1.382	0.367	0.482	(1)	3.507
1990	0.295	0.270	0.631	1.196	0.336	0.495	(1)	3.333
1991	0.257	0.233	0.657	1.147	0.349	0.491	(1)	3.252
1992	0.257	0.243	0.683	1.184	0.343	0.492	(1)	3.288
1993	0.279	0.257	0.588	1.124	0.321	0.485	(1)	3.170
1994	0.273	0.270	0.570	1.113	0.320	0.481	(1)	3.134
1995	0.268	0.302	0.610	1.179	0.293	0.457	(1)	3.161
1996	0.288	0.306	0.598	1.192	0.282	0.459	(1)	3.157
1997	0.290	0.314	0.497	1.101	0.268	0.466	(1)	3.112

**Source:** U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *National Air Pollutant Emissions Trends Report, 1970-1997*, Table A-5 (EPA, OAQPS, Research Triangle Park, NC, 1998), and earlier reports in this series.

**Notes:** PM-10 refers to particulate matter with a diameter 10 micrometers or less. na = not available. (1) Emissions from miscellaneous and natural sources are reported in Table 5.6. Non-road sources include non-road diesel (e.g., construction and farm) and railroads.

**Table 5.6 U.S. Emissions of Miscellaneous and Natural Particulate Matter (PM-10) by Source, 1988-1997**

Year	Agriculture and forestry	Fire & other combustion	Fugitive dust				Natural sources (wind erosion)	Total all sources
			Un-paved roads	Paved roads	Construction	Other		
..... million tons .....								
1988	7.453	1.704	12.379	5.900	11.662	0.346	30.287	18.110
1989	7.320	0.912	11.798	5.769	11.269	0.392	29.229	12.101
1990	5.146	1.203	11.234	2.248	4.249	0.337	18.069	2.092
1991	5.106	0.941	11.206	2.399	4.092	0.378	18.076	2.077
1992	4.909	0.785	10.918	2.423	4.460	0.370	18.171	2.227
1993	4.475	0.768	11.430	2.462	4.651	0.410	18.954	0.509
1994	4.690	1.048	11.370	2.538	5.245	0.570	19.722	2.160
1995	4.661	0.778	10.362	2.409	3.654	0.587	17.013	1.146
1996	4.708	1.004	12.060	2.390	3.950	0.603	19.002	5.316
1997	4.707	1.015	12.305	2.515	4.022	0.588	19.429	5.316
								30.468

**Source:** U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *National Air Pollutant Emissions Trends Report, 1970-1997*, Table A-5 (EPA, OAQPS, Research Triangle Park, NC, 1998).

**Notes:** Fugitive dust category "Other" includes 0.001 million tons of wind erosion for each year 1990 through 1997. Totals may not agree with sum of components due to independent rounding.

**Table 5.7 U.S. Emissions of Lead by Source, Five-Year Intervals, 1970-1980, and Annually, 1988-1997**

Year	Industrial processes							Total industrial
	Chemical industries	Metals processing	Petro- leum indus- tries	Other indus- tries	Solvent utili- zation	Storage and trans- port	Waste disposal and recycling	
	thousand tons							
1970	0.103	24.224	n/a	2.028	n/a	n/a	2.200	28.555
1975	0.120	9.923	n/a	1.337	n/a	n/a	1.595	12.975
1980	0.104	3.026	n/a	0.808	n/a	n/a	1.210	5.148
1988	0.136	1.965	n/a	0.172	n/a	n/a	0.817	3.09
1989	0.136	2.088	n/a	0.173	n/a	n/a	0.765	3.161
1990	0.136	2.169	n/a	0.169	n/a	n/a	0.804	3.278
1991	0.132	1.975	n/a	0.167	n/a	n/a	0.807	3.081
1992	0.093	1.773	n/a	0.056	n/a	n/a	0.812	2.734
1993	0.092	1.899	n/a	0.054	n/a	n/a	0.824	2.869
1994	0.096	2.027	n/a	0.053	n/a	n/a	0.829	3.005
1995	0.163	2.048	n/a	0.058	n/a	n/a	0.604	2.873
1996	0.167	2.052	n/a	0.051	n/a	n/a	0.622	2.892
1997	0.159	2.038	n/a	0.054	n/a	n/a	0.646	2.897
Fuel combustion								
Year	Electric utilities	Indus- trial	Other	Total	On-road vehicles	Non- road sources	Miscel- laneous	Total all sources
	thousand tons							
	1970	0.327	0.237	10.052	10.616	171.961	9.737	n/a 220.869
1975	0.230	0.075	10.042	10.347	130.206	6.130	n/a	159.659
1980	0.129	0.060	4.111	4.299	60.501	4.205	n/a	74.153
1988	0.066	0.019	0.426	0.511	2.566	0.885	n/a	7.053
1989	0.067	0.018	0.420	0.505	0.982	0.820	n/a	5.468
1990	0.064	0.018	0.418	0.500	0.421	0.776	n/a	4.975
1991	0.061	0.018	0.416	0.495	0.018	0.574	n/a	4.168
1992	0.059	0.018	0.414	0.490	0.018	0.565	n/a	3.808
1993	0.061	0.019	0.415	0.495	0.019	0.529	n/a	3.911
1994	0.061	0.018	0.415	0.494	0.019	0.525	n/a	4.043
1995	0.057	0.017	0.414	0.488	0.019	0.544	n/a	3.924
1996	0.061	0.016	0.416	0.493	0.020	0.505	n/a	3.910
1997	0.064	0.017	0.415	0.496	0.019	0.503	n/a	3.915

**Source:** U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *National Air Pollutant Emissions Trends Report, 1970-1997*, Table A-8 (EPA, OAQPS, Research Triangle Park, NC, 1998), and earlier reports in this series.

**Notes:** n/a = not applicable. Non-road sources include non-road gasoline engines and aircraft.

**Table 5.8 U.S. Emissions of Greenhouse Gases, 1990-1997**

Gas	1990	1991	1992	1993	1994	1995	1996	1997
million metric tons of carbon equivalent								
Carbon dioxide	1,356	1,341	1,361	1,394	1,414	1,428	1,479	1,501
Methane	173	174	174	170	171	172	167	167
Nitrous oxide	82	83	85	86	91	88	86	85
HFCs, PFCs and SF <sub>6</sub>	22	22	23	23	26	31	35	38

**Source:** U.S. Department of Energy, Energy Information Administration, *Emissions of Greenhouse Gases in the United States, 1997*, DOE/EIA-0573(98) (GPO, Washington, DC, 1998).

**Notes:** HFCs = Hydrofluorocarbons. PFCs = Perfluorocarbons. SF<sub>6</sub> = Sulfur hexafluoridene. Emissions include direct and indirect effects. Data for 1997 are preliminary. Data in this table are revised from the data in the previous EIA report, *Emissions of Greenhouse Gases in the United States, 1996*, DOE/EIA-0573(97) (GPO, Washington, DC, 1997).

**Table 5.9 U.S. Precipitation Chemistry by Region, 1985-1997**

Year	Eastern United States						
	Ph units	Hydro- gen ion ug/l	Sulfate ion .....	Nitrate ion .....	Ammon- ium ion milligrams per liter	Calcium ion .....	Precip- itation cm
1985	4.43	37.57	2.02	1.25	0.23	0.15	106.7
1986	4.42	38.16	2.14	1.30	0.24	0.13	102.2
1987	4.42	38.06	2.09	1.33	0.26	0.14	100.7
1988	4.43	37.05	2.14	1.33	0.21	0.17	95.9
1989	4.47	34.25	2.01	1.35	0.31	0.15	110.8
1990	4.49	32.71	1.80	1.18	0.27	0.12	122.6
1991	4.47	34.00	1.87	1.27	0.26	0.14	111.0
1992	4.49	32.04	1.77	1.22	0.25	0.12	108.4
1993	4.47	33.64	1.78	1.28	0.26	0.11	113.7
1994	4.48	33.07	1.71	1.24	0.28	0.13	111.9
1995	4.55	28.17	1.47	1.23	0.28	0.13	109.3
1996	4.60	28.01	1.49	1.22	0.28	0.14	123.0
1997	4.56	30.44	1.55	1.28	0.26	0.18	105.8

See next page for continuation of table.

**Table 5.9 U.S. Precipitation Chemistry by Region, 1985-1997 (continued)**

Year	Western United States						
	Ph	Hydro-	Sulfate	Nitrate	Ammon-	Calcium	Precip-
	units	gen ion	ion	ion	ium ion	ion	itation
1985	5.13	7.40	0.82	0.71	0.18	0.23	62.0
1986	5.18	6.57	0.78	0.68	0.17	0.19	72.4
1987	5.11	7.82	0.83	0.83	0.24	0.19	62.2
1988	5.10	7.93	0.93	0.83	0.16	0.27	56.6
1989	5.23	5.84	0.87	0.91	0.29	0.25	56.7
1990	5.21	6.22	0.80	0.87	0.29	0.22	66.2
1991	5.20	6.31	0.77	0.80	0.24	0.21	68.4
1992	5.23	5.86	0.77	0.83	0.28	0.18	65.1
1993	5.27	5.41	0.71	0.76	0.23	0.18	74.4
1994	5.07	8.53	0.76	0.92	0.28	0.20	62.0
1995	5.11	7.73	0.70	0.79	0.27	0.19	77.7
1996	5.24	6.99	0.70	0.86	0.29	0.21	74.5
1997	5.15	8.48	0.67	0.83	0.24	0.18	74.9
Year	Entire United States						
	Ph	Hydro-	Sulfate	Nitrate	Ammon-	Calcium	Precip-
	units	gen ion	ion	ion	ium ion	ion	itation
1985	4.57	27.07	1.60	1.06	0.21	0.17	91.1
1986	4.57	27.16	1.67	1.08	0.21	0.15	91.8
1987	4.56	27.53	1.65	1.15	0.25	0.15	87.3
1988	4.57	26.91	1.72	1.16	0.19	0.21	82.2
1989	4.61	24.35	1.61	1.20	0.30	0.19	91.9
1990	4.63	23.49	1.45	1.07	0.28	0.16	102.9
1991	4.61	24.36	1.49	1.11	0.26	0.16	96.1
1992	4.64	22.92	1.42	1.09	0.26	0.14	93.3
1993	4.62	23.81	1.41	1.10	0.25	0.14	100.0
1994	4.61	24.53	1.38	1.13	0.28	0.15	94.5
1995	4.68	21.04	1.20	1.08	0.28	0.15	98.3
1996	4.81	21.13	1.23	1.10	0.28	0.16	107.0
1997	4.76	22.79	1.24	1.13	0.25	0.14	95.1

**Source:** National Trends Network of the National Atmospheric Deposition Program, unpublished, Champaign, IL, 1999.

**Notes:** ug/l = micrograms per liter. cm = centimeters. Data are from 73 sites in the eastern United States and 39 sites in the western United States. Sites included in the computations are those where (1) precipitation amounts are available for at least 90% of the summary period and (2) at least 60% of the precipitation during the summary period is represented by valid samples.

**Table 5.10 U.S. National Composite Mean Ambient Concentrations of Criteria Air Pollutants, 1978-1997**

Year	Carbon monoxide	Lead	Nitrogen dioxide	Ozone	PM-10 particulates	Sulfur dioxide
	ppm	ug/m <sup>3</sup>	ppm	ppm	ug/m <sup>3</sup>	ppm
	(208 sites)	(160 sites)	(93 sites)	(320 sites)	na	(343 sites)
1978	9.7	1.16	0.024	0.149	na	0.0120
1979	9.5	1.01	0.024	0.137	na	0.0118
1980	8.8	0.76	0.023	0.139	na	0.0108
1981	8.5	0.60	0.022	0.127	na	0.0103
1982	7.9	0.53	0.021	0.125	na	0.0095
1983	7.8	0.39	0.021	0.139	na	0.0092
1984	7.8	0.35	0.021	0.124	na	0.0094
1985	7.0	0.24	0.021	0.123	na	0.0087
1986	7.0	0.15	0.021	0.119	na	0.0086
1987	6.7	0.12	0.021	0.125	na	0.0084
	(368 sites)	(195 sites)	(224 sites)	(660 sites)	(845 sites)	(486 sites)
1988	6.3	0.12	0.021	0.130	32.4	0.0089
1989	6.3	0.09	0.021	0.114	32.1	0.0087
1990	5.8	0.09	0.020	0.112	29.5	0.0081
1991	5.6	0.07	0.020	0.113	29.2	0.0079
1992	5.1	0.06	0.019	0.105	26.9	0.0073
1993	4.9	0.05	0.019	0.108	26.2	0.0072
1994	5.0	0.05	0.020	0.107	26.2	0.0069
1995	4.5	0.04	0.019	0.112	25.1	0.0056
1996	4.2	0.04	0.018	0.105	24.2	0.0056
1997	3.9	0.04	0.018	0.105	24.0	0.0054

**Source:** U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *National Air Quality and Emissions Trends Report, 1997*, Table A-9 (EPA, OAQPS, Research Triangle Park, NC, 1998).

**Notes:** ppm = parts per million. ug/m<sup>3</sup> = micrograms per cubic meter. na = not available. Sulfur dioxide and nitrogen dioxide records are annual arithmetic means, Carbon monoxide records are arithmetic means of second maximum non-overlapping 8-hour concentrations. Ozone records are arithmetic means of second daily maximum 1-hour concentrations. Lead records are arithmetic means of maximum quarterly measurements. PM-10 records are weighted annual arithmetic means. The National Ambient Air Quality Standards for these pollutants are as follows: sulfur dioxide, 0.03 ppm; carbon monoxide, 9 ppm; ozone, 0.12 ppm; nitrogen dioxide, 0.053 ppm; PM-10, 50 ug/m<sup>3</sup>; and lead, 1.5 ug/m<sup>3</sup>.

## Air Quality

**Table 5.11 Air Quality Trends in Selected U.S. Urban Areas, 1988-1997**

MSA	Trend sites	number of PSI days greater than 100									
	#	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Atlanta	9	44	17	52	24	19	42	13	43	22	26
Bakersfield	7	126	114	97	109	100	97	97	104	109	55
Baltimore	16	60	28	29	50	23	48	41	36	28	30
Boston	24	28	12	7	13	9	6	10	8	2	8
Chicago	42	40	16	5	21	4	3	8	21	6	9
Cincinnati	21	57	19	19	22	3	13	19	22	11	11
Cleveland	24	45	19	10	23	11	13	23	24	17	12
Dallas	8	37	18	24	2	11	11	15	36	12	15
Dayton	10	37	10	13	12	2	11	14	11	18	9
Denver	20	35	16	11	7	8	3	2	2	0	0
Detroit	30	35	18	11	28	8	5	13	14	13	12
El Paso	17	15	26	22	7	11	9	8	5	7	3
Houston	26	72	43	54	37	32	28	45	65	28	47
Indianapolis	31	39	15	9	12	7	9	22	19	13	12
Kansas City	22	23	5	2	11	1	3	10	22	10	18
Los Angeles	36	239	222	174	174	178	137	144	109	94	63
Memphis	12	44	8	24	9	14	16	11	18	17	14
Miami	10	8	6	1	1	3	6	1	2	1	3
Minn/St. Paul	24	11	8	4	2	3	0	2	7	2	0
New York	28	57	30	37	50	11	19	21	19	15	23
Orange City	12	56	58	46	35	38	25	15	9	9	3
Philadelphia	34	53	44	39	48	24	50	26	30	22	32
Phoenix	23	29	34	13	11	15	17	11	25	17	15
Pittsburgh	38	43	21	19	22	9	13	19	25	11	20
Riverside	36	185	190	158	159	175	167	148	125	118	106
Sacramento	13	88	71	66	69	48	22	37	34	33	2
St. Louis	53	44	29	24	33	16	9	32	35	20	15
San Diego	20	123	128	97	67	66	57	45	47	31	14
San Francisco	9	1	0	0	0	0	0	2	0	0	0
Seattle	16	20	7	10	5	3	0	3	0	6	1
Ventura	13	108	93	70	89	55	44	64	66	62	44
Wash, DC	32	56	27	26	49	15	47	21	30	18	28
Youngstown	9	25	8	3	14	5	2	0	11	5	3
Subtotal	725	1,883	1,360	1,176	1,215	927	932	940	1,026	777	653
Other sites	604	1,428	648	658	724	312	489	469	641	418	490
All sites	1,329	3,311	2,008	1,834	1,939	1,239	1,421	1,409	1,667	1,195	1,143

**Source:** U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *National Air Quality and Emissions Trends Report, 1997*, Table A-15 (EPA, OAQPS, Research Triangle Park, NC, 1998).

**Notes:** MSA = Metropolitan Statistical Area. PSI = Pollutant Standards Index. Minn = Minneapolis. The PSI index integrates information from many pollutants across an entire monitoring network into a single number which represents the worst daily air quality experienced in an urban area. PSI index ranges and health effect descriptor words are as follows: 0 to 50 (good); 51 to 100 (moderate); 101 to 199 (unhealthful); 200 to 299 (very unhealthful); and 300 and above (hazardous).

**Table 5.12 Number of People Living in U.S. Counties with Air Quality Concentrations Above the Level of the National Ambient Air Quality Standards, 1986-1997**

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
	population, in millions											
SO <sub>2</sub>	0.9	1.6	1.7	0.1	1.4	5.2	0.0	1.4	0.04	0.0	0.2	0.1
NO <sub>2</sub>	7.5	7.5	8.3	8.5	8.5	8.9	0.0	0.0	0.0	0.0	0.0	0.0
CO	41.4	29.4	29.5	33.6	21.7	19.9	14.3	11.6	15.3	12.0	12.7	9.1
O <sub>3</sub>	75.0	88.6	111.9	66.7	62.9	69.7	44.6	51.3	50.2	70.8	39.3	101.6 <sup>1</sup>
Pb	4.5	1.7	1.6	1.6	5.3	14.7	4.7	5.5	4.4	4.8	4.1	2.4
PM-10	41.7	21.5	25.6	27.4	18.8	21.5	25.8	9.4	13.1	24.4	7.3	9.7 <sup>2</sup>
Any												
NAAQS	na	101.8	121.3	84.4	47.4	86.4	53.6	59.1	62.0	79.8	46.6	107.03

**Source:** U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *National Air Quality and Emissions Trends Report, 1997*, p. 9 (EPA, OAQPS, Research Triangle Park, NC, 1998) and earlier trends reports.

**Notes:** NAAQS = National Ambient Air Quality Standards. PM-10 = particulate matter with a diameter of 10 micrometers or less. <sup>1</sup>Data are based on the revised NAAQS. The population living in counties with air quality concentrations above the pre-existing NAAQS for ozone was 47.9 million. <sup>2</sup>Data are based on the revised NAAQS. The population living in counties with air quality concentrations above the pre-existing NAAQS for PM-10 was 7.9 million. Data for PM-2.5 not yet available. <sup>3</sup>Data are based on the revised NAAQS. The population living in counties with air quality concentrations above the pre-existing NAAQS was 52.6 million. Population estimates are intended to provide a relative measure of the extent of the problem for each pollutant in a single year. An individual living in a county that had a measured concentration above the level of the NAAQS may not actually be exposed to unhealthy air.

**Table 5.13 Population in U.S. Nonattainment Areas Not Meeting at Least One of the National Ambient Air Quality Standards, 1991-1997**

	1991	1992	1993	1994	1995	1996	1997
	1990 population in millions						
Population	150.53	148.86	147.07	145.28	132.48	122.75	113.00

**Source:** U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *National Air Quality and Emissions Trends Report, 1997* (EPA, OAQPS, Research Triangle Park, NC, 1998) and earlier trends reports.

**Notes:** When an area does not meet the air quality standard for one of the criteria pollutants it may be subject to EPA's formal rule-making process which designates it as nonattainment. Population figures were obtained from 1990 census data. For nonattainment areas defined as only partial counties, population figures for just the nonattainment areas were used when these were available. Otherwise, whole county population figures were used. Population estimates in this table differ from those presented in Table 5.12 because formal nonattainment designations are based on multiple years data rather than a single year and generally do not follow county boundaries. For example, ozone nonattainment areas typically compose the entire metropolitan area, which may include additional counties that do not contain air quality monitors.)

# Aquatic Resources

**Table 6.1 U.S. Annual Average Precipitation Trends, 1895-1997**

Year	Mean	Index	Year	Mean	Index	Year	Mean	Index
	inches	standardized z-score		inches	standardized z-score		inches	standardized z-score
1895	26.73	-1.05	1930	25.01	-1.40	1965	28.95	0.40
1896	28.73	-0.14	1931	26.79	-0.66	1966	26.67	-1.13
1897	28.35	-0.09	1932	29.60	0.24	1967	28.61	-0.14
1898	28.93	-0.32	1933	26.80	-1.13	1968	29.52	0.35
1899	27.64	-0.71	1934	25.05	-2.06	1969	29.79	0.35
1900	30.02	-0.48	1935	28.85	-0.42	1970	28.54	-0.47
1901	26.85	-0.84	1936	26.59	-1.16	1971	29.29	0.32
1902	29.63	-0.30	1937	29.72	0.27	1972	30.77	0.50
1903	28.54	-0.58	1938	28.85	0.42	1973	33.99	1.43
1904	27.09	-1.23	1939	25.82	-1.48	1974	29.72	-0.30
1905	32.14	1.12	1940	29.63	0.50	1975	32.02	1.42
1906	31.49	1.58	1941	31.85	1.67	1976	25.62	-1.62
1907	30.01	0.72	1942	30.58	0.31	1977	29.62	0.51
1908	29.07	0.24	1943	26.07	-1.20	1978	29.17	0.48
1909	29.95	0.66	1944	30.08	0.41	1979	32.02	1.04
1910	24.17	-2.30	1945	32.25	1.11	1980	27.38	-0.52
1911	28.81	0.21	1946	30.42	0.55	1981	29.17	0.01
1912	29.56	0.56	1947	28.57	-0.39	1982	32.99	2.15
1913	29.12	0.47	1948	29.65	0.35	1983	33.81	2.11
1914	28.01	-0.26	1949	29.70	0.20	1984	30.48	0.85
1915	31.69	1.26	1950	29.99	-0.31	1985	29.41	0.47
1916	28.61	0.32	1951	30.33	0.78	1986	30.61	0.59
1917	24.37	-2.45	1952	25.63	-1.64	1987	28.46	-0.06
1918	28.02	0.38	1953	27.51	-0.85	1988	25.25	-1.52
1919	30.94	0.54	1954	25.23	-1.70	1989	28.42	-0.64
1920	30.37	0.87	1955	26.81	-1.05	1990	31.40	1.13
1921	27.68	-0.27	1956	24.57	-2.38	1991	31.77	0.89
1922	29.09	0.36	1957	32.90	1.38	1992	30.67	1.01
1923	30.78	1.19	1958	29.25	0.11	1993	31.41	1.39
1924	25.75	-1.76	1959	29.88	-0.05	1994	29.46	0.43
1925	26.06	-0.81	1960	27.95	-0.45	1995	31.03	1.04
1926	29.95	0.31	1961	30.41	0.19	1996	32.59	1.16
1927	30.93	1.06	1962	27.80	-0.53	1997	31.29	1.31
1928	28.59	-0.77	1963	24.77	-1.60			
1929	29.51	-0.12	1964	29.23	-0.31			

**Source:** U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Climatic Data Center, *Climate Variations Bulletin*, Vol. 7 (DOC, NOAA, NCDC, Asheville, NC, December 1997) and agency updates.

**Notes:** The U.S. national precipitation index expresses precipitation departure from the 60-year (1931-90) mean in terms of standard deviations. It is computed from data from the Cooperative Station Network. The monthly precipitation for all stations within each of the 344 divisions in the contiguous United States is averaged to compute a divisional monthly precipitation. The divisional precipitation values are standardized using the gamma distribution over the 1931-90 period. The divisional standardized precipitation index values are then weighted by area to compute a national precipitation index value. A national annual value is computed from the monthly national values. The annual index values are then normalized over the period of record.

**Table 6.2 Severe to Extreme Drought and Wetness in the Conterminous United States, 1900-1997**

Year	Severe to extreme drought	Severe to extreme wetness	Year	Severe to extreme drought	Severe to extreme wetness	Year	Severe to extreme drought	Severe to extreme wetness
	% area	% area		% area	% area		% area	% area
1900	15.5	5.8	1933	9.9	2.4	1966	8.2	5.6
1901	18.2	4.1	1934	46.4	0.4	1967	6.1	6.0
1902	22.5	6.8	1935	20.6	3.5	1968	3.2	8.4
1903	7.1	13.1	1936	22.1	2.7	1969	0.5	11.0
1904	13.5	9.1	1937	17.0	5.0	1970	0.6	6.1
1905	6.7	19.3	1938	7.2	7.0	1971	5.1	9.0
1906	0.9	25.9	1939	15.9	3.2	1972	3.5	12.9
1907	0.9	29.5	1940	17.7	2.3	1973	2.7	30.9
1908	2.2	16.2	1941	10.4	27.2	1974	4.0	15.3
1909	5.0	18.8	1942	3.7	28.7	1975	0.5	20.8
1910	14.6	7.4	1943	3.5	11.5	1976	6.9	9.2
1911	18.6	7.3	1944	4.9	8.7	1977	22.7	4.7
1912	0.8	17.3	1945	2.7	18.1	1978	2.8	14.0
1913	3.2	15.5	1946	1.9	9.4	1979	1.1	21.9
1914	6.6	17.8	1947	4.8	12.6	1980	5.1	11.6
1915	4.3	25.9	1948	5.9	10.2	1981	13.1	4.5
1916	1.0	29.4	1949	3.6	6.6	1982	1.1	17.5
1917	8.7	17.8	1950	6.3	10.1	1983	0.0	36.0
1918	13.1	5.0	1951	11.5	14.6	1984	2.2	26.3
1919	4.0	13.1	1952	11.0	11.0	1985	2.9	21.0
1920	1.7	20.9	1953	15.8	3.5	1986	4.4	15.1
1921	4.0	8.9	1954	36.6	2.7	1987	7.8	16.5
1922	4.8	5.2	1955	26.0	1.7	1988	22.2	5.8
1923	4.7	10.9	1956	34.1	4.3	1989	18.7	6.9
1924	11.8	11.2	1957	13.0	11.6	1990	19.0	7.2
1925	18.1	2.6	1958	1.6	18.4	1991	9.2	9.0
1926	9.4	7.0	1959	9.4	3.9	1992	10.8	18.3
1927	5.7	17.7	1960	9.5	6.7	1993	1.2	35.1
1928	5.1	15.3	1961	12.0	7.1	1994	6.9	14.8
1929	6.9	12.9	1962	3.1	6.0	1995	1.6	24.8
1930	12.1	4.7	1963	16.5	2.0	1996	7.9	23.2
1931	28.9	6.1	1964	18.3	3.0	1997	3.5	25.7
1932	8.6	8.9	1965	6.3	14.2			

**Source:** U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Climatic Data Center, *Climate Variations Bulletin*, Vol. 7 (DOC, NOAA, NCDC, Asheville, NC, December 1997) and agency updates.

**Notes:** This table presents the average annual values of the percent area experiencing severe to extreme drought and wet conditions based on the Palmer Drought Severity Index (PDSI). PDSI is based on a water balance model that consists of a hydrologic accounting between water supply and demand. The index values range from negative (indicating drought), to zero (near normal conditions), to positive (wet spell). The index has been calculated on a monthly basis for the contiguous United States since 1896.

**Table 6.3 U.S. Water Use by Source and End-use Sector, 1900-1995**

Year	Source		End-use sector					Total
	Ground water	Surface water	Public supply	Rural domestic and livestock	Irrigation	Thermo-electric utility	Commercial and other industrial	
	..... billions of gallons per day .....							
1900	na	na	3.0	2.0	20.0	5.0	10.0	40.0
1910	na	na	5.0	2.2	39.0	7.0	14.0	67.2
1920	na	na	6.0	2.4	56.0	9.0	18.0	91.4
1930	na	na	8.0	2.9	60.0	18.0	21.0	109.9
1940	na	na	10.0	3.1	71.0	23.0	29.0	136.1
1945	na	na	12.0	3.4	80.0	31.5	35.0	161.9
1950	34.0	150.0	14.0	3.6	89.0	40.0	37.0	183.6
1955	47.6	198.0	17.0	3.6	110.0	72.0	39.0	241.6
1960	50.4	221.0	21.0	3.6	110.0	100.0	38.0	272.6
1965	60.5	253.0	24.0	4.0	120.0	130.0	46.0	324.0
1970	69.0	303.0	27.0	4.5	130.0	170.0	47.0	378.5
1975	83.0	329.0	29.0	4.9	140.0	200.0	45.0	418.9
1980	83.9	361.0	34.0	5.6	150.0	210.0	45.0	444.6
1985	73.7	320.0	37.0	7.8	140.0	190.0	31.0	405.8
1990	80.6	327.2	38.5	7.9	137.0	195.0	29.9	408.8
1995	77.4	323.0	40.2	8.8	134.0	189.9	28.0	400.8

**Sources:** U.S. Department of Commerce, Bureau of the Census, *Historical Statistics of the United States: Colonial Times to 1970*, Series J 92-103 (GPO, Washington, DC, 1975).

Solley, W.B., R.R. Pierce and H. A. Perlman, *Estimated Use of Water in the United States in 1995*, USGS Circular 1200 (GPO, Washington, DC, 1998) and earlier reports in this series.

**Notes:** na = not available. Totals may not agree with sum of components due to independent rounding.

**Table 6.4 Designated-use Support in Surface Waters of the United States, 1996**

Designated-use support	Rivers and streams	Lakes, ponds and reservoirs	Estuaries
	miles	acres	square miles
Fully supporting	390,873	8,626,903	16,753
Supporting, but threatened	54,978	1,651,685	1,041
Impaired	248,028	6,541,060	11,025
Total surface waters surveyed	693,905	16,819,769	28,819
Total surface waters not surveyed	2,940,247	24,865,133	11,020
Total surface waters	3,634,152	41,684,902	39,839

**Source:** U.S. Environmental Protection Agency, Office of Water, *National Water Quality Inventory: 1996 Report to Congress* (EPA, OW, Washington, DC, 1998).

**Table 6.5 Trends in U.S. Stream Water Quality, 1980-1989**

Water quality indicators	NASQAN* stations analyzed	Flow-adjusted concentrations		
		Upward trend	Downward trend	No trend
.....number of stations.....				
Dissolved solids	340	28	46	266
Nitrate	344	22	27	295
Total phosphorus	410	19	92	299
Suspended sediments	324	5	37	282
Dissolved oxygen	424	38	26	360
Fecal coliform	313	10	40	263

**Source:** Smith, R.A., R.B. Alexander and K.J. Lanfear, "Stream Water Quality in the Conterminous United States -- Status and Trends of Selected Indicators During the 1980's," In *National Water Summary 1990-91, Hydrologic Events and Stream Water Quality*, R.W. Paulson, E.B. Chase, J.S. Williams and D.W. Moody, Compilers, Water Supply Paper 2400 (U.S. Department of the Interior, Geological Survey, Reston, VA, 1993), Figures 38-43.

**Notes:** \*Analyses were made on data from the U.S. Geological Survey's National Stream Quality Accounting Network (NASQAN) stations. Data for total phosphorus cover the period 1982-1989.

**Table 6.6 Ambient Water Quality in U.S. Rivers and Streams: Violation Rates, 1975-1997**

Year	Fecal coliform bacteria	Dissolved oxygen	Total phosphorus	Total cadmium, dissolved	Total lead, dissolved
<i>percent of all measurements exceeding national water quality criteria</i>					
1975	36	5	5	*	*
1976	32	6	5	*	*
1977	34	11	5	*	*
1978	35	5	5	*	*
1979	34	4	3	4	13
1980	31	5	4	1	5
1981	30	4	4	1	3
1982	33	5	3	1	2
1983	34	4	3	1	5
1984	30	3	4	<1	<1
1985	28	3	3	<1	<1
1986	24	3	3	<1	<1
1987	23	2	3	<1	<1
1988	22	2	4	<1	<1
1989	30	3	2	<1	<1
1990	26	2	3	<1	<1
1991	15	2	2	<1	<1
1992	28	2	2	<1	<1
1993	31	<1	2	na	na
1994	28	2	2	na	na
1995	35	1	4	na	na
1996	na	1	1	<1	<1
1997	na	1	2	<1	<1

**Source:** U.S. Geological Survey, national-level data, unpublished, Reston, VA, 1999.

**Notes:** \*Base figure too small to meet statistical standards for reliability of derived figures. na = not available. Violation levels are based on the following U.S. Environmental Protection Agency water quality criteria: fecal coliform bacteria—above 200 cells per 100 ml; dissolved oxygen—below 5 milligrams per liter; total phosphorus—above 1.0 milligrams per liter; cadmium, dissolved—above 10 micrograms per liter; and total lead, dissolved—above 50 micrograms per liter.

**Table 6.7 Estimated Phosphorus Loadings to the Great Lakes, 1976-1991**

Year	Lake Superior	Lake Michigan	Lake Huron	Lake Erie	Lake Ontario
	metric tons				
1976	3,550	6,656	4,802	18,480	12,695
1977	3,661	4,666	3,763	14,576	8,935
1978	5,990	6,245	5,255	19,431	9,547
1979	6,619	7,659	4,881	11,941	8,988
1980	6,412	6,574	5,307	14,855	8,579
1981	3,412	4,091	3,481	10,452	7,437
1982	3,160	4,084	4,689	12,349	8,891
1983	3,407	4,515	3,978	9,880	6,779
1984	3,642	3,611	3,452	12,874	7,948
1985	2,864	3,956	5,758	11,216	7,083
1986	3,059	4,981	4,210	11,118	9,561
1987	1,949	3,298	2,909	8,381	7,640
1988	2,067	2,907	3,165	7,841	6,521
1989	2,323	4,360	3,227	8,568	6,728
1990	1,750	3,006	2,639	12,899	8,542
1991	2,709	3,478	4,460	11,113	10,475

**Source:** Great Lakes Water Quality Board, *Great Lakes Water Quality Surveillance Subcommittee Report to the International Joint Commission*, United States and Canada, (International Joint Commission, Windsor, ON, Canada, biennial).

**Notes:** The 1978 Great Lakes Water Quality Agreement set target loadings for each lake (in metric tons per year): Lake Superior, 3,400; Lake Michigan, 5,600; Lake Huron, 4,360; Lake Erie, 11,000; and Lake Ontario, 7,000. Data do not include loadings to the St. Lawrence River. Data analysis was discontinued after 1991.

**Table 6.8 Oil Polluting Incidents Reported In and Around U.S. Waters, 1970-1997**

Year	Number thousands	Volume million gallons	Year	Number thousands	Volume million gallons
1970	3.71	15.25	1984	8.26	18.01
1971	8.74	8.84	1985	6.17	8.44
1972	9.93	18.81	1986	4.99	4.28
1973	9.01	15.25	1987	4.84	3.61
1974	9.99	15.72	1988	5.00	6.59
1975	9.30	21.52	1989	6.61	13.48
1976	9.42	18.52	1990	8.18	7.97
1977	9.46	8.19	1991	8.57	3.76
1978	10.64	10.86	1992	9.49	1.88
1979	9.83	20.89	1993	8.97	2.07
1980	8.38	12.60	1994	9.44	19.51
1981	7.81	8.92	1995	6.49	1.98
1982	7.48	10.35	1996	4.37	2.00
1983	7.92	8.38	1997	8.62	0.94

**Source:** U.S. Department of Transportation, United States Coast Guard, *Pollution Incidents In and Around U.S. Waters A Spill/Release Compendium: 1969-1997* (DOT, USCG, Washington, DC, 1999).

--, Bureau of Transportation Statistics, *National Transportation Statistics 1998*, Table 4-42 (DOT, BTS, Washington, DC, 1998).

**Notes:** Data for 1997 are preliminary. Includes oil spill data for vessels and non-vessels (e.g., facilities, pipelines, and other unknown sources).

**Table 6.9 U.S. Shellfish Growing Waters, 1966-1995**

Year	1966	1971	1974	1980	1985	1990	1995
..... thousand acres .....							
Approved for harvest	8,100	10,362	10,560	10,685	11,402	12,304	14,853
Harvested limited	2,090	3,738	4,232	3,533	5,435	6,398	6,721
Conditionally approved	88	410	387	587	1,463	1,571	1,695
Restricted	na	30	34	55	637	463	2,106
Conditionally restricted	na	na	na	na	na	0	119
Prohibited	2,002	3,298	3,811	2,891	3,335	4,364	2,801
Total	10,190	14,100	14,792	14,218	16,837	18,701	21,573

**Source:** U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Survey, Office of Ocean Resources Conservation and Assessment, Strategic Environmental Assessments Division, *The 1995 National Shellfish Register of Classified Growing Waters* (DOC, NOAA, ORCA, Silver Spring, MD, 1997).

**Notes:** Based on National Shellfish Registers published only in years indicated. Data do not include Alaska, Hawaii, or waters designated as unclassified. The total acreage of classified shellfish growing waters varies with each register. There may be several reasons why shellfish harvest is prohibited, including water quality problems, lack of funding for complete surveying and monitoring, conservation measures, and other management/administrative actions.

**Table 6.10 Status of Stock Levels of U.S. Fisheries, 1992-1994**

Fishery	Current status relative to the level producing LTPY				
	Below	Near	Above	Unknown	Total
	..... number of species .....				
Northeast demersals	19	3	2	1	25
Northeast pelagics	1	2	3	0	6
Atlantic anadromous	4	0	1	0	5
Northeast invertebrates	0	3	2	1	6
Atlantic highly migratory pelagics	4	4	0	2	10
Atlantic sharks	1	0	1	1	3
Atlantic/Gulf coastal migratory pelagics	1	3	0	3	7
Atlantic/Gulf reef fish	9	2	0	17	28
Southeast drum and croaker	4	0	0	3	7
Southeast menhaden	0	2	0	0	2
Southeast/Caribbean invertebrates	3	6	0	5	14
Pacific coast salmon	2	3	0	0	5
Alaska salmon	1	1	3	0	5
Pacific coast and Alaska pelagics	3	4	0	0	7
Pacific coast groundfish	6	4	4	5	19
Western Pacific invertebrates	1	0	0	0	1
Western Pacific bottomfish*	3	3	0	0	6
Pacific highly migratory pelagics	2	12	0	1	15
Alaska groundfish	6	8	8	3	25
Alaska shellfish	3	0	1	1	5
Subtotal	73	60	25	43	201
Nearshore species	10	14	0	50	74
Total assessed species	83	74	25	93	275

**Source:** U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, *Our Living Oceans, Report on the Status of U.S. Living Marine Resources, 1995*, NOAA Technical Memorandum NMFS-F/SPO-19 (DOC, NOAA, NMFS, Washington, DC, 1996).

**Notes:** LTPY is long-term potential yield or the maximum long-term average catch that can be achieved from the resource. This term is analogous to the concept of maximum sustainable yield. Stock level relative to LTPY is a measure of stock status. The present abundance level of the stock is compared with the level of abundance which on average would support the LTPY harvest. This level is expressed as below, near, above, or unknown relative to the abundance level that would produce LTPY. Demersal = bottom-dwelling fishes such as flounders, skates, and dogfish. Pelagic = mid-water fishes such as blue fish, anchovies, sardines, and squids. Anadromous = fishes which ascend rivers to spawn, such as salmon, shad, and striped bass. Invertebrates = lobsters, clams, scallops, shrimp, etc. Highly migratory = high-seas (oceanic) fishes such as tunas, swordfish, and billfishes. Coastal migratory = fishes that range from the shore to the outer edge of the U.S. continental shelf, such as king and Spanish mackerel, dolphin fish, and cobia. Reef fish = fishes that prefer coral reefs, artificial structures, and other hard bottom areas, such as snappers, groupers, and amberjacks. Reef fish also include tilefishes that prefer sand bottom areas. \*Also includes armorhead.

**Table 6.11 Waterborne Disease Outbreaks and Cases in the United States, 1971-1996**

Year	Waterborne disease outbreaks by water supply system				Total cases number	
	Community	Non-community	Individual			
			number	number		
1971	8	8	4	20	5,184	
1972	9	19	2	30	1,650	
1973	6	16	3	25	1,762	
1974	11	9	5	25	8,356	
1975	6	16	2	24	10,879	
1976	9	23	3	35	5,068	
1977	14	18	2	34	3,860	
1978	10	19	3	32	11,435	
1979	24	13	8	45	9,841	
1980	26	20	7	53	20,045	
1981	14	18	4	36	4,537	
1982	26	15	3	44	3,588	
1983	30	9	4	43	21,036	
1984	12	5	10	27	1,800	
1985	7	14	1	22	1,946	
1986	10	10	2	22	1,569	
1987	8	6	1	15	22,149	
1988	6	10	1	16	2,169	
1989	6	6	1	13	2,670	
1990	6	7	2	15	1,748	
1991	2	13	0	15	12,960	
1992	6	10	3	19	4,504	
1993	9	4	5	18	404,190	
1994	5	6	2	13	651	
1995	8	7	1	16	2,375	
1996	2	3	1	6	192	

**Sources:** M.H. Kramer, B.L. Herwaldt, G.F. Craun, R.L. Calderon and D.D. Juranek, "Surveillance for Waterborne-Disease Outbreaks—United States, 1993-1994," In *CDC Surveillance Summaries*, April 12, 1996, Morbidity and Mortality Weekly Report 42(SS-5) (U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, Atlanta, GA), pp. 7-8, and earlier reports in this series.

D.A. Levy, M.S. Bens, G.F. Craun, R.L. Calderon, and B.L. Herwaldt, "Surveillance for Waterborne-Disease Outbreaks—United States, 1995-1996," In *CDC Surveillance Summaries*, December 11, 1998, Morbidity and Mortality Weekly Report 47(SS-5) (U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, Atlanta, GA).

**Notes:** The number of waterborne disease outbreaks and the number of affected people or cases reported to the Centers for Disease Control and Prevention and to the U.S. Environmental Protection Agency represents a fraction of the total number that occur. Therefore, these data should not be used to draw firm conclusions about the true incidence of waterborne disease outbreaks.

**Table 6.12 U.S. Wetlands by Type, Mid-1950s to Mid-1990s**

Wetlands type	Mid-1950s	Mid-1970s	Mid-1980s	Mid-1990s
	million acres			
Estuarine wetlands	5.59	5.53	5.10	5.09
Palustrine marshes	33.07	24.31	25.88	25.01
Palustrine shrub wetlands	11.00	15.51	15.60	17.07
Palustrine forested wetlands	55.09	55.15	50.39	47.93
Other palustrine wetlands	2.70	5.35	5.14	5.79
Total wetland acreage	107.45	105.85	102.12	100.91

**Sources:** Dahl, T.E., R.D. Young and M.C. Caldwell, *Status and Trends of Wetlands in the Conterminous United States, 1980s to 1990s* (U.S. Department of the Interior, Fish and Wildlife Service, Washington, DC, Draft).

Dahl, T.E. and C.E. Johnson, *Status and Trends of Wetlands in the Conterminous United States, 1970s to 1980s* (U.S. Department of the Interior, Fish and Wildlife Service, Washington, DC, 1991).

Frayer, W.E., T.J. Monahan, D.C. Bowden and F.A. Graybill, *Status and Trends of Wetlands and Deepwater Habitats in the Conterminous United States, 1950s to 1970s* (Colorado State University, Fort Collins, CO, 1983).

**Note:** Totals may not agree with sum of components due to independent rounding.

**Table 6.13 Wetlands Losses by Current State Boundaries, 1780s-1980s**

State	Total surface area of state	Wetlands area		Wetlands losses %
		1780s	1980s	
	million acres			
Alabama	33.03	7.57	3.78	50
Alaska	375.30	170.20	170.00	<1
Arizona	72.90	0.93	0.60	36
Arkansas	33.99	9.85	2.76	72
California	101.56	5.00	0.45	91
Colorado	66.72	2.00	1.00	50
Connecticut	3.21	0.67	0.17	74
Delaware	1.32	0.48	0.22	54
Florida	37.48	20.33	11.04	46
Georgia	37.68	6.84	5.30	23
Hawaii	4.12	0.06	0.05	12
Idaho	53.47	0.88	0.39	56
Illinois	36.10	8.21	1.25	85
Indiana	23.23	5.60	0.75	87
Iowa	36.03	4.00	0.42	89
Kansas	52.65	0.84	0.44	48
Kentucky	25.85	1.57	0.30	81
Louisiana	31.05	16.19	8.78	46

See next page for continuation of table.

**Table 6.13 Wetlands Losses by Current State Boundaries, 1780s-1980s (continued)**

State	Total surface area of state ..... million acres	Wetlands area		Wetlands losses %
		1780s	1980s	
Maine	21.26	6.46	5.20	20
Maryland	6.77	1.65	0.44	73
Massachusetts	5.28	0.82	0.59	28
Michigan	37.26	11.20	5.58	50
Minnesota	53.80	15.07	8.70	42
Mississippi	30.54	9.87	4.07	59
Missouri	44.60	4.84	0.64	87
Montana	94.17	1.15	0.84	27
Nebraska	49.43	2.91	1.91	35
Nevada	70.75	0.49	0.24	52
New Hampshire	5.95	0.22	0.20	9
New Jersey	5.02	1.50	0.92	39
New Mexico	77.87	0.72	0.48	33
New York	31.73	2.56	1.03	60
North Carolina	33.66	11.09	5.69	49
North Dakota	45.23	4.93	2.49	49
Ohio	26.38	5.00	0.48	90
Oklahoma	44.75	2.84	0.95	67
Oregon	62.07	2.26	1.39	38
Pennsylvania	29.01	1.13	0.50	56
Rhode Island	0.78	0.10	0.07	37
South Carolina	19.88	6.41	4.66	27
South Dakota	49.31	2.74	1.78	35
Tennessee	27.04	1.94	0.79	59
Texas	171.10	16.00	7.61	52
Utah	54.35	0.80	0.56	30
Vermont	6.15	0.34	0.22	35
Virginia	26.12	1.85	1.07	42
Washington	43.64	1.35	0.94	31
West Virginia	15.48	0.13	0.10	24
Wisconsin	35.94	9.80	5.33	46
Wyoming	62.66	2.00	1.25	38

**Source:** Dahl, T.E., *Wetlands Losses in the United States 1780s to 1980s* (U.S. Department of the Interior, Fish and Wildlife Service, Washington, DC, 1991).

**Table 6.14 Average Annual Acres of U.S. Wetlands Converted to Upland Uses, Mid-1950s to Mid-1990s**

Post-conversion land use	1954- 1974 <sup>1</sup>	1974- 1983 <sup>2</sup>	1985- 1995 <sup>3</sup>
<i>thousands of acres per year (average)</i>			
Agriculture	398.5	156.6	na
Urban use	36.6	14.5	na
Other upland uses	23.4	118.9	na
Total	458.0	290.0	117.0
<i>percent of average annual conversion</i>			
Agriculture	87	54	na
Urban use	8	5	na
Other upland uses	5	41	na
Total	100	100	100

**Sources:** <sup>1</sup>Frayer, W.E., T.J. Monahan, D.C. Bowden and F.A. Graybill, *Status and Trends of Wetlands and Deepwater Habitats in the Conterminous United States, 1950s to 1970s* (U.S. Department of the Interior, Fish and Wildlife Service, Fort Collins, CO, 1983).

<sup>2</sup>Dahl, T.E. and C.E. Johnson, *Status and Trends of Wetlands in the Conterminous United States, 1970s to 1980s* (U.S. Department of the Interior, Fish and Wildlife Service, Washington, DC, 1991).

<sup>3</sup>Dahl, T.E., R.D. Young and M.C. Caldwell, *Status and Trends of Wetlands in the Conterminous United States, 1980s to 1990s* (U.S. Department of the Interior, Fish and Wildlife Service, Washington, DC, Draft).

**Notes:** Data reflect net wetlands losses (= losses plus gains) by category. Other upland uses include silvicultural activities, residential and recreational development in rural areas, and highway construction and improvements in rural areas. A significant portion of lands classified as "other" in the 1974-1983 study were wetlands that had been drained and cleared of vegetation, but the land had not been put to an identifiable use (as determined by interpretation of aerial photography and groundtruthing).

# Terrestrial Resources

**Table 7.1 Land Use and Ownership in the United States, 1900-1992**

Year	Crop-land	Land use				Ownership	
		Grassland pasture & rangeland	Forest- use land	Special- use & other land	Total	Private & other public	Federal
million acres							
1900	319	1,044	366	175	1,904	52.7	47.3
1910	347	814	562	181	1,904	68.5	31.5
1920	402	750	567	185	1,904	73.8	26.2
1930	413	708	607	176	1,904	74.0	26.0
1945	451	660	602	193	1,905	73.7	26.3
1949	478	632	606	189	1,904	73.5	26.5
1954	466	634	615	191	1,904	73.5	26.5
1959	458	633	745	435	2,271	61.0	39.0
1964	444	640	732	450	2,266	60.4	39.6
1969	472	604	723	465	2,264	66.5	33.5
1974	465	598	718	483	2,264	66.5	33.5
1978	471	587	703	503	2,264	67.2	32.9
1982	469	597	655	544	2,265	67.9	32.2
1987	464	591	648	562	2,265	68.1	31.9
1992	460	591	648	564	2,263	71.3	28.7

**Sources:** Daugherty, A.B., *Major Uses of Land in the United States: 1992*, Agricultural Economic Report No. 723 (GPO, Washington, DC, 1995) and supporting database.

U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States* (GPO, Washington, DC, annual).

**Notes:** Prior to 1959, excludes Alaska and Hawaii. Other changes in total land area result from refinements in measuring techniques. Historical estimates are based on imperfect data. Estimates differ slightly from previously published due to minor adjustments made by ERS and published in Major Land Uses (1945-1992) diskette in 1996. Cropland estimates for 1987 and 1992 differ slightly from data in Table 7.4 from the 1997 Census of Agriculture and may be revised in future publications based on census data. Grassland and range includes grassland pasture and rangeland; excludes cropland used only for pasture which is included in the cropland category and forest land grazed which is included in the forest land category. Special-use land includes rural transportation areas, areas used primarily for recreation and wildlife purposes, various public installations and facilities, farmsteads and farm roads, and urban areas. Other includes areas in miscellaneous uses not inventoried, marshes, open swamps, bare rock areas, desert, tundra, and other land generally having low value for agricultural purposes. Federal includes original public-domain lands vested in the U.S. government by virtue of its sovereignty as well as lands acquired by the U.S. government by purchase, condemnation, and gift. Land-use and land-ownership estimates are not strictly comparable. Totals may not agree with sum of components due to independent rounding.

**Table 7.2 Special and Other Land Uses in the United States, 1945-1992**

	Transportation	Parks & wilderness	National defense	Urban	Farmsteads	Other	Total
<i>million acres</i>							
1945	22.61	22.58	24.76	15.01	15.03	93.42	193.41
1949	22.88	27.64	21.46	18.28	15.07	84.01	189.34
1954	27.49	27.50	27.40	18.56	12.24	80.50	193.70
1959	25.22	46.94	31.12	27.22	11.37	293.16	435.03
1964	25.99	75.51	31.88	29.27	10.51	276.71	449.86
1969	25.95	81.34	25.59	31.01	10.34	290.98	465.21
1974	26.32	87.47	25.04	34.82	8.07	300.78	482.49
1978	26.63	97.95	24.90	44.65	8.42	300.85	503.40
1982	26.73	211.02	23.95	50.18	8.04	224.00	543.92
1987	25.70	224.86	20.92	56.64	7.13	226.66	561.90
1992	25.24	228.85	20.48	58.91	6.21	224.44	564.12

**Source:** Daugherty, A.B., *Major Uses of Land in the United States: 1992*, Agricultural Economic Report No. 723 (GPO, Washington, DC, 1995) and supporting database.

Note: Other land is defined in the note to Table 7.1.

**Table 7.3 Number of Farms and Land in Farms in the United States, 1900-1997**

Year	Farm size								Total Number Acres			
	1 - 49 acres		50 - 499 acres		500 - 999 acres		1,000 + acres					
	Number	Acres	Number	Acres	Number	Acres	Number	Acres				
..... millions .....												
1900	1.93	49	3.37	520	0.10	68	0.05	200	5.74	837		
1910	2.25	49	3.93	570	0.13	84	0.05	167	6.37	870		
1920	2.31	59	3.93	580	0.15	100	0.07	221	6.45	960		
1925	2.42	57	3.75	550	0.14	97	0.06	224	6.37	928		
1930	2.36	56	3.69	550	0.16	109	0.08	277	6.30	992		
1935	2.69	59	3.86	540	0.17	114	0.09	310	6.81	1,023		
1940	2.29	50	3.55	540	0.16	112	0.10	366	6.10	1,068		
1945	2.25	47	3.32	520	0.17	119	0.11	460	5.86	1,146		
1950	1.97	39	3.12	500	0.18	126	0.12	495	5.39	1,160		
1954	1.70	32	2.76	460	0.19	132	0.13	531	4.78	1,155		
1959	1.06	22	2.32	410	0.20	137	0.14	555	3.71	1,124		
1964	0.82	17	1.98	360	0.21	145	0.15	585	3.16	1,107		
1969	0.64	14	1.73	320	0.22	148	0.15	578	2.73	1,060		
1974	0.51	11	1.44	273	0.21	142	0.16	590	2.31	1,024		
1978	0.54	12	1.34	256	0.21	147	0.16	600	2.26	1,015		
1982	0.64	13	1.24	233	0.20	141	0.16	600	2.24	987		
1987	0.60	12	1.12	212	0.20	139	0.17	602	2.09	965		
1992	0.56	11	1.01	190	0.19	129	0.17	615	1.93	945		
1997	0.56	12	0.99	182	0.18	122	0.18	616	1.91	932		

**Sources:** U.S. Department of Commerce, Bureau of the Census, *Historical Statistics of the United States: Colonial Times to 1970* (GPO, Washington, DC, 1975).

U.S. Department of Agriculture, National Agricultural Statistical Service, 1997 Census of Agriculture, Vol. I: Part 51, Chapter 1. *United States Summary National-Level Data, National, State and County Tables* (Internet accessible data tables as of February 22, 1999), and earlier census reports.

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**Table 7.4 Major Uses of U.S. Cropland, Agricultural Census Years, 1945-1997**

Year	Cropland used for crops				Cropland		Idled by federal programs	
	Harvested	Failed	Cultivated summer fallow	Idle cropland	Cropland pasture	Total		
			million acres					
1945	336	9	18	40	47	454	4.1	
1949	352	9	26	22	67	478	0.0	
1954	339	13	28	19	66	465	0.0	
1959	317	10	31	33	66	457	22.5	
1964	292	6	37	52	57	444	55.0	
1969	286	6	41	51	88	472	57.5	
1974	322	8	31	21	83	465	2.7	
1978	330	7	32	26	76	471	18.3	
1982	347	5	31	21	65	469	11.1	
1987	282	4	35	57	65	443	76.2	
1992	296	6	27	40	67	435	54.9	
1997	309	4	21	33	65	431	29.5	

**Sources:** U.S. Department of Agriculture, National Agricultural Statistical Service, 1997 Census of Agriculture, Vol. I: Part 51, Chapter 1. *United States Summary National-Level Data, National, State and County Tables* (Internet accessible data tables as of February 22, 1999).

U.S. Department of Commerce, Bureau of the Census, *Census of Agriculture for 1992*, Vol. I: *Geographic Area Series, Part 51 United States Summary and State Data*, Table 7, p. 17, AC92-A-51 (GPO, Washington, DC, 1994), and earlier census reports.

**Notes:** Excludes Alaska and Hawaii. Fewer than 200,000 acres were used for crops in Alaska and Hawaii in 1997. A double-cropped acre is counted as one acre. Idle cropland also includes cropland voluntarily planted in cover crops, legumes, and soil-improvement grasses, but not harvested, not pastured, and not enrolled in the Conservation Reserve Program (CRP). Cropland is also idled under various federal farm programs, including in previous years the Agricultural Conservation Program (1936-1947), Soil Bank (1956-1970), Cropland Adjustment Program (1961-1977), Agricultural Reduction Program (1961-1995), and CRP (1986-1997). CRP data for 1997 also includes cropland idled by the Wetlands Reserve Program, but does not include 16.1 million acres of newly enrolled CRP land.

**Table 7.5 Cropland Tillage Practices Used in the Production of U.S. Field Crops, 1989-1997**

	Total area planted	Conven- tional tillage	Reduced tillage	Conservation tillage			Total
				No- till	Ridge- till	Mulch- till	
<i>million acres</i>							
1989	279.6	137.3	70.7	14.1	2.7	54.7	71.7
1990	280.9	136.7	71.0	16.9	3.0	53.3	73.2
1991	281.2	129.8	72.3	20.6	3.2	55.3	79.1
1992	282.9	120.8	73.4	28.1	3.4	57.3	88.7
1993	278.1	107.9	73.2	34.8	3.5	58.9	97.1
1994	283.9	111.4	73.2	39.0	3.6	56.8	99.3
1995	278.7	109.7	70.1	40.9	3.4	54.6	98.9
1996	290.2	111.6	74.8	42.9	3.4	57.5	103.8
1997	294.6	107.6	77.3	46.0	3.7	60.0	109.8
<i>percent of planted acres</i>							
1989	100	49.1	25.3	5.1	1.0	19.6	25.6
1990	100	48.7	25.3	6.0	1.1	19.0	26.1
1991	100	46.1	25.7	7.3	1.1	19.7	28.1
1992	100	42.7	25.9	9.9	1.2	20.2	31.4
1993	100	38.8	26.3	12.5	1.2	21.2	34.9
1994	100	39.3	25.8	13.7	1.3	20.0	35.0
1995	100	39.3	25.2	14.7	1.2	19.6	35.5
1996	100	38.4	25.8	14.8	1.2	19.8	35.8
1997	100	36.5	26.2	15.6	1.3	20.4	37.3

**Source:** Conservation Technology Information Center, *National Crop Residue Management Survey Annual Report* (CTIC, West Lafayette, IN, annual).

**Notes:** Conventional tillage leaves less than 15 percent residue after planting. Reduced tillage leaves 15-30 percent residue after planting. Conservation tillage leaves over 30 percent residue after planting. Conservation tillage includes no till (the soil is left undisturbed prior to planting, except for nutrient injection, and planting or drilling is accomplished in a narrow seeded or slot created by coulters, row openers, disk openers, inrow chisels, or rototillers), ridge till (the soil is left undisturbed prior to planting, except for nutrient injection, and planting is completed in a seedbed prepared on ridges with sweeps, disk openers, coulters, or row cleaners; residue is left on the surface between ridges), and mulch till (the surface is disturbed before planting but 30 percent or more residue remains after planting).

**Table 7.6 Erosion on U.S. Cropland, 1982-1992**

Year	Sheet and rill erosion		Wind erosion	
	billion tons per year	tons per acre per year	billion tons per year	tons per acre per year
1982	1.7	4.1	1.4	3.3
1987	1.5	3.7	1.3	3.2
1992	1.2	3.1	0.9	2.5

**Source:** U.S. Department of Agriculture, National Resource Conservation Service, *Summary Report 1992 National Resources Inventory* (USDA, NRCS, Washington, DC, 1995).

**Table 7.7 U.S. Agricultural Productivity Indexes, 1948-1996**

Year	Farm input				Farm output			Total productivity
	Purchased input	Labor	Capital	Total	Crops	Live-stock	Total	
..... index (1948 = 100) .....								
1948	100	100	100	100	100	100	100	100
1949	112	98	111	106	95	106	100	94
1950	113	94	121	106	91	110	99	94
1951	118	90	129	107	95	116	104	97
1952	119	88	137	107	98	118	107	100
1953	119	83	141	106	98	120	107	102
1954	112	81	145	102	95	124	108	105
1955	122	82	147	107	99	127	111	104
1956	126	77	148	107	99	130	112	105
1957	130	72	147	106	98	128	111	105
1958	135	69	146	106	107	129	117	110
1959	143	69	147	109	109	135	120	110
1960	143	67	147	108	113	134	122	113
1961	140	65	144	106	113	140	125	118
1962	142	64	143	106	115	141	126	119
1963	146	63	144	107	119	145	130	122
1964	145	59	144	105	115	149	130	124
1965	145	58	144	104	123	144	132	128
1966	154	54	146	105	121	147	133	127
1967	156	51	150	104	127	152	138	132
1968	151	49	151	102	130	152	140	137
1969	156	48	151	103	134	152	142	138
1970	158	48	151	103	129	158	142	137
1971	156	47	153	103	144	160	151	147
1972	160	46	152	103	143	162	152	147
1973	163	47	157	105	153	164	158	150
1974	165	43	162	105	140	161	149	142
1975	159	43	163	103	160	152	158	154

See next page for continuation of this table.

**Table 7.7 U.S. Agricultural Productivity Indexes, 1948-1996 (continued)**

Year	Farm input			Farm output			Total productivity
	Purchased input	Labor	Capital	Total	Crops	Live-stock	
..... <i>index (1948 = 100)</i> .....							
1976	169	43	165	106	159	160	161
1977	166	41	167	105	173	163	170
1978	189	39	167	110	178	163	173
1979	198	38	170	113	195	166	184
1980	202	37	174	114	177	174	177
1981	192	37	173	111	204	177	194
1982	184	36	171	109	205	175	194
1983	185	35	161	105	160	179	170
1984	180	35	164	105	200	176	192
1985	175	32	161	102	210	181	200
1986	171	30	155	98	198	182	194
1987	173	30	147	97	201	186	197
1988	172	31	144	96	176	190	185
1989	171	31	144	96	202	191	200
1990	178	30	142	97	217	193	210
1991	179	32	141	98	215	198	211
1992	178	30	140	96	235	203	224
1993	186	29	137	96	210	204	211
1994	190	29	136	97	249	218	240
1995	193	28	135	97	225	223	227
1996	183	30	135	96	242	222	237
							247

**Source:** U.S. Department of Agriculture, Economic Research Service, *Agricultural Outlook* (USDA, ERS, Washington, DC, monthly).

**Notes:** Productivity = output/input. Purchased input includes chemicals, fuels, electricity, feed, seed, and livestock purchases; contract labor and custom machine services; machine and building maintenance and repair; irrigation from public sellers of water; and miscellaneous farm production items. Labor includes both hired and self-employed labor. Capital includes durable equipment and real estate. Livestock output includes meat animals, dairy products, poultry, eggs, wool, mohair, horses, mules, goats, sheep, rabbits, fur animals, aquaculture, honey, and beeswax. Crop outputs include food grains, feed grains, oil crops, sugar crops, cotton, cottonseed, vegetables, fruit trees, nut trees, tobacco, floriculture, ornamentals, Christmas trees, mushrooms, legume seeds, grass seeds, hops, mint, broomcorn, popcorn, hemp, and flax.

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**Table 7.8 U.S. Commercial Fertilizer Use, 1960-1997**

Year	Gross tonnage <i>million tons</i>	Active ingredients (nutrient content)			Total
		Nitrogen	Phosphate	Potash <i>million tons</i>	
1960	24.9	2.7	2.6	2.2	7.5
1961	25.6	3.0	2.6	2.2	7.8
1962	26.6	3.4	2.8	2.3	8.4
1963	28.8	3.9	3.1	2.5	9.5
1964	30.7	4.4	3.4	2.7	10.5
1965	31.8	4.6	3.5	2.8	10.9
1966	34.5	5.3	3.9	3.2	12.4
1967	37.1	6.0	4.3	3.6	14.0
1968	38.7	6.8	4.5	3.8	15.0
1969	38.9	7.0	4.7	3.9	15.5
1970	39.6	7.5	4.6	4.0	16.1
1971	41.1	8.1	4.8	4.2	17.2
1972	41.2	8.0	4.9	4.3	17.2
1973	43.3	8.3	5.1	4.6	18.0
1974	47.1	9.2	5.1	5.1	19.3
1975	42.5	8.6	4.5	4.5	17.6
1976	49.2	10.4	5.2	5.2	20.8
1977	51.6	10.6	5.6	5.8	22.1
1978	47.5	10.0	5.1	5.5	20.6
1979	51.5	10.7	5.6	6.2	22.6
1980	52.8	11.4	5.4	6.2	23.1
1981	54.0	11.9	5.4	6.3	23.7
1982	48.7	11.0	4.8	5.6	21.4
1983	41.8	9.1	4.1	4.8	18.1
1984	50.1	11.1	4.9	5.8	21.8
1985	49.1	11.5	4.7	5.6	21.7
1986	44.1	10.4	4.2	5.1	19.7
1987	43.0	10.2	4.0	4.8	19.1
1988	44.5	10.5	4.1	5.0	19.6
1989	44.8	10.6	4.1	4.8	19.5
1990	47.7	11.1	4.3	5.2	20.6
1991	47.3	11.3	4.2	5.0	20.5
1992	48.8	11.5	4.2	5.0	20.7
1993	49.2	11.4	4.4	5.1	20.9
1994	52.3	12.6	4.5	5.3	22.4
1995	50.7	11.7	4.4	5.1	21.3
1996	53.4	12.3	4.5	5.2	22.0
1997	55.0	12.3	4.6	5.4	22.3

**Sources:** The Association of American Plant Food Control Officials (AAPFCO), *Commercial Fertilizers, 1996* (AAPFCO, Lexington, KY, 1997) and earlier issues.

U.S. Department of Agriculture, Economic Research Service, *AREI UPDATES: Nutrient Use and Practices on Major Field Crops*, Table 1, p. 2 (USDA, ERS, Washington, DC, 1997) and agency updates.

**Notes:** Quantity refers to total fertilizer materials. Includes fertilizer use on farms, lawns, golf courses, home gardens, and other nonfarm lands. Includes Puerto Rico.

**Table 7.9 Farm Pesticide Use on Major U.S. Crops, 1964-1995**

Year	Herbicides	Insecticides	Fungicides	Other	Total
<i>million pounds of active ingredients</i>					
1964	48.16	123.30	22.17	21.38	215.01
1966	79.38	119.24	23.24	18.75	240.61
1971	175.67	127.71	29.31	31.71	364.40
1976	341.39	131.73	26.63	30.74	530.49
1982	430.35	82.65	25.22	34.23	572.45
1990	344.64	57.39	27.77	67.90	497.69
1991	335.18	52.83	29.44	79.45	496.90
1992	350.53	60.05	34.92	90.02	535.52
1993	323.51	58.10	36.58	97.81	516.00
1994	350.45	67.90	43.06	129.64	591.04
1995	323.79	69.60	44.80	127.45	565.64

**Source:** Lin, B., M. Padgett, H. Delvo, D. Shank, and H. Taylor, *Pesticide and Fertilizer Use and Trends in U.S. Agriculture*, AER 717 (USDA, ERS, Washington, DC, 1995) and unpublished USDA survey data.

**Notes:** Estimates include pesticide use on corn, soybeans, wheat, cotton, potatoes, other vegetables, citrus fruits, apples, and other fruit. Estimates are not directly comparable with Table 7.10 because of different survey methodologies.

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**Table 7.10 U.S. Commercial Pesticide Use by Sector and Type, 1979-1995**

	Agriculture						Industry, commercial, & government					
	Herbi-	In-	Fungi-	Other	Other	Total	Herbi-	In-	Fungi-	Other	Other	Total
	cides	secti-	cides	con-	chem-		cides	secti-	cides	con-	chem-	
<i>million pounds of active ingredients</i>												
1979	492	188	57	106	246	1,089	85	35	50	46	27	243
1980	504	163	59	100	227	1,053	83	35	45	46	25	234
1981	513	152	62	104	215	1,046	82	37	43	46	24	232
1982	503	142	59	101	207	1,012	80	39	41	45	24	229
1983	455	135	59	100	196	945	80	40	40	45	24	229
1984	516	129	56	100	194	995	78	41	38	41	24	222
1985	501	126	59	94	194	974	70	43	37	41	23	214
1986	481	121	59	94	188	943	68	45	36	41	23	213
1987	425	90	52	91	180	838	65	42	34	39	22	202
1988	450	100	54	95	177	876	64	41	32	39	22	198
1989	460	95	54	113	161	883	63	40	31	38	22	194
1990	455	90	50	133	164	892	63	39	31	38	22	193
1991	440	85	47	144	140	856	60	38	30	37	21	186
1992	450	90	45	150	161	896	58	35	28	36	21	178
1993	425	80	47	154	166	872	56	32	25	36	20	169
1994	485	90	48	163	163	949	52	30	23	34	20	159
1995	461	91	49	170	168	939	48	29	20	31	22	150
<i>million pounds of active ingredients</i>												
	Home & garden						Total					
	Herbi-	In-	Fungi-	Other	Other	Total	Herbi-	In-	Fungi-	Other	Other	Total
	cides	secti-	cides	con-	chem-		cides	secti-	cides	con-	chem-	
<i>million pounds of active ingredients</i>												
1979	33	32	17	3	70	155	610	255	124	155	343	1,487
1980	35	30	18	3	69	155	622	228	122	149	321	1,442
1981	36	29	17	3	68	153	631	218	122	152	307	1,430
1982	37	29	17	3	67	153	620	210	117	149	298	1,394
1983	38	29	16	3	67	153	573	204	115	148	287	1,327
1984	40	27	15	3	67	152	634	197	109	145	284	1,369
1985	40	24	14	3	67	148	611	193	110	138	284	1,336
1986	41	22	14	3	67	147	590	188	109	138	278	1,303
1987	42	20	14	3	67	146	532	152	100	133	269	1,186
1988	43	20	13	3	67	146	557	161	99	137	266	1,220
1989	44	19	13	2	68	146	567	154	98	154	251	1,224
1990	46	19	10	2	66	143	564	148	91	173	252	1,228
1991	46	18	9	2	65	140	546	141	86	182	226	1,181
1992	46	18	8	2	64	138	554	143	81	189	246	1,213
1993	46	18	8	2	62	136	527	130	80	192	248	1,177
1994	46	18	8	2	61	135	583	138	79	199	244	1,243
1995	47	17	8	2	59	133	556	137	77	203	249	1,222

**Source:** Aspelin, A.L., *Pesticide Industry Sales and Usage: 1994 and 1995 Market Estimates* (U.S. Environmental Protection Agency, Washington, DC, 1997).

**Notes:** Other conven. = other conventional pesticides. Other chemicals = chemicals produced mainly for other purposes but also used as pesticides (e.g., chlorine, sulfur).

**Table 7.11 Irrigated U.S. Farmland, 1890-1997**

Year	Seventeen Western states	Other states	Total
	.....	million acres	.....
1890	3.5	0.1	3.5
1900	7.5	0.3	7.8
1910	11.3	0.4	11.7
1920	13.9	0.5	14.5
1930	14.1	0.6	14.7
1940	17.2	0.7	18.0
1950	24.3	1.5	25.8
1959	30.7	2.4	33.2
1964	33.2	3.9	37.1
1969	34.8	4.3	39.1
1974	36.6	4.6	41.2
1978	43.2	7.2	50.3
1982	41.3	7.7	49.0
1987	37.5	8.9	46.4
1988	38.9	9.7	48.6
1989	40.0	9.5	49.5
1990	39.4	9.8	49.2
1991	39.9	10.1	50.0
1992	39.1	10.3	49.4
1993	39.6	10.2	49.8
1994	40.8	11.0	51.8
1995	41.2	10.8	52.0
1996	42.2	11.1	53.3
1997	43.0	12.1	55.1

**Sources:** U.S. Department of Agriculture, Economic Research Service, *Agricultural Resources and Environmental Indicators, 1996-97, AH-712* (USDA, ERS, Washington, DC, 1997) and earlier ERS reports.

U.S. Department of Agriculture, National Agricultural Statistical Service, *1997 Census of Agriculture, Vol. I: Part 51, Chapter 2. United States Summary and State Data, State Tables* (Internet accessible data tables as of February 22, 1999).

U.S. Department of Commerce, Bureau of the Census. *Census of Agriculture for 1992, Vol. I: Geographic Area Series, Part 51 United States Summary and State Data, Table 9, p. 18, AC92-A-51* (GPO, Washington, DC, 1994) and earlier census reports.

**Notes:** The seventeen Western states include Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming. Data for 1890-1992 and 1997 are from the Census of Agriculture. Data for other years are estimates constructed from data provided by the USDA, National Agricultural Statistics Service (NASS).

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**Table 7.12 Condition of U.S. Nonfederal Rangeland, Selected Years, 1963-1992, and Bureau of Land Management Rangeland, Selected Years, 1936-1997**

Rangeland condition	Nonfederal					Bureau of Land Management				
	1963	1977	1982	1987	1992	1936	1966	1975	1986	1997
.....% rangeland acreage.....										
Excellent	5	12	4	3	6	2	2	2	4	4
Good	15	28	30	30	34	14	17	15	30	32
Fair	40	42	45	47	44	48	52	50	41	37
Poor	40	18	16	14	15	36	30	33	18	13
Unclassified	na	na	5	6	1	na	na	na	na	13

**Sources:** U.S. Department of Agriculture, Natural Resources Conservation Service, *National Resources Inventory* (USDA, NRCS, Washington, DC, 1977, 1982, 1987, and 1992).

U.S. Department of the Interior, Bureau of Land Management, *Public Land Statistics* (DOI, BLM, Washington, DC, annual).

**Notes:** na = not available. Rangeland condition refers to the present state of the vegetation at a rangeland site in relation to the climax (natural potential) plant community for that site. It is expressed as the degree of similarity of present vegetation to the climax plant community: Excellent (equivalent to Potential Natural Community) = 76-100% similarity; Good (Late Seral) = 51-75% similarity; Fair (Mid Seral) = 26-50% similarity; and Poor (Early Seral) = 0-25% similarity. Unclassified includes rangeland for which data and estimates are not available, dry lakebeds, rock outcrops, and other areas for which data cannot be gathered. NRI is conducted every five years; BLM data are updated annually to reflect new information and changes in rangeland condition classes. NRI and BLM data are not strictly comparable because of different survey methodologies.

**Table 7.13 Timberland in the United States by Ownership, 1952-1992**

Year	Farmer and other private	Forest industry	National forests	Other public	Total
.....million acres.....					
1952	304.5	59.0	94.7	50.7	508.9
1962	307.5	61.4	96.8	49.3	515.1
1977	285.3	68.9	88.7	49.5	491.1
1987	283.6	70.3	85.2	45.8	484.9
1992	287.6	70.5	84.7	46.8	489.6

**Source:** Powell, D.S., J.L. Faulkner, D.R. Darr, Z. Zhu and D.W. MacCleery, *Forest Statistics of the United States, 1992*, General Technical Report RM-234 (U.S. Department of Agriculture, Forest Service, Washington, DC, 1993).

**Table 7.14 Annual Net Growth and Removals of U.S. Growing Stock, 1952-1991, and Volume of U.S. Growing Stock, 1952-1992**

Year	Net growth and removals of growing stock									
	Farmer and other private		Forest industry		National forests		Other public		Total	
	Net Growth	Re-movals	Net Growth	Re-movals	Net Growth	Re-movals	Net Growth	Re-movals	Net Growth	Re-movals
..... billion cubic feet .....										
1952	8.1	6.9	2.6	3.3	2.1	1.1	1.2	0.6	13.9	11.9
1962	9.5	6.4	3.2	3.0	2.5	1.9	1.6	0.7	16.7	12.0
1976	12.6	6.8	4.2	4.2	3.1	2.1	2.0	1.1	21.9	14.2
1986	12.1	8.2	4.3	5.4	3.4	2.3	2.3	1.2	22.1	16.0
1991	12.1	8.0	4.3	5.3	3.3	2.0	1.9	1.0	21.6	16.3

  

Year	Volume of growing stock									
	Farmer and other private		Forest industry		National forests		Other public		Total	
	Soft-wood	Hard-wood	Soft-wood	Hard-wood	Soft-wood	Hard-wood	Soft-wood	Hard-wood	Soft-wood	Hard-wood
..... billion cubic feet .....										
1952	94.8	133.7	77.4	20.3	204.4	13.6	55.2	16.5	431.8	184.1
1962	104.3	152.5	76.1	25.4	213.7	17.2	55.7	20.7	449.8	215.8
1977	125.3	185.8	74.5	32.3	208.1	21.6	59.0	26.5	467.0	266.1
1986	136.6	220.8	72.8	35.3	186.3	25.1	57.3	31.4	452.9	312.6
1992	143.4	242.3	71.0	34.8	185.6	25.6	50.0	33.0	449.9	335.7

**Sources:** Powell, D.S., J.L. Faulkner, D.R. Darr, Z. Zhu and D.W. MacCleery, *Forest Statistics of the United States, 1992*, General Technical Report RM-234 (U.S. Department of Agriculture, Forest Service, Washington, DC, 1993).

**Table 7.15 U.S. Production of Timber Products by Major Product, Five-Year Intervals, 1950-1965, and Annually, 1966-1994**

Year	Lumber	Plywood & veneer	Pulp products	Fuel	Miscellaneous	Total
million cubic feet, roundwood equivalent						
1950	5,905	345	1,500	2,270	770	10,800
1955	5,785	575	2,200	1,745	630	10,970
1960	5,080	705	2,575	1,300	510	10,220
1965	5,665	1,030	3,095	915	567	11,477
1966	5,630	1,035	3,190	845	582	11,522
1967	5,325	1,025	3,195	780	562	11,227
1968	5,545	1,120	3,385	700	101	11,776
1969	5,415	1,050	3,585	620	601	11,681
1970	5,215	1,020	3,840	535	575	11,655
1971	5,390	1,170	3,560	500	538	11,548
1972	5,535	1,300	3,520	475	562	11,932
1973	5,670	1,320	3,755	505	621	12,446
1974	5,095	1,150	4,220	535	635	12,090
1975	4,890	1,170	3,485	570	583	11,153
1976	5,585	1,355	3,810	600	625	12,530
1977	5,950	1,425	3,650	1,000	646	13,196
1978	6,155	1,460	3,745	1,525	619	14,089
1979	6,115	1,370	4,105	2,205	690	15,150
1980	5,305	1,175	4,390	3,105	693	15,228
1981	4,775	1,180	4,125	3,180	646	14,336
1982	5,048	1,119	3,819	3,355	603	14,457
1983	6,044	1,426	4,285	3,235	591	16,141
1984	6,396	1,391	4,681	3,620	590	17,237
1985	6,210	1,426	4,561	3,450	599	16,861
1986	7,077	1,538	4,857	3,096	616	17,768
1987	7,588	1,587	5,137	3,076	633	18,678
1988	7,642	1,538	5,221	3,066	713	18,948
1989	7,440	1,406	5,429	3,041	781	19,121
1990	7,213	1,368	5,353	3,019	805	18,720
1991	6,677	1,226	5,434	3,028	842	18,139
1992	6,864	1,265	5,463	3,044	877	18,389
1993	6,660	1,257	5,391	3,084	864	18,042
1994	6,880	1,268	5,417	3,134	910	18,392

**Sources:** Howard, J.L., *U.S. Timber Production, Trade, Consumption, and Price Statistics, 1965-1994*, Table 4a, p. 12, General Technical Report FPL-GTR-98 (U.S. Department of Agriculture, Forest Service, Forest Products Laboratory, Madison, WI, 1997) and earlier reports in this series.

**Notes:** Miscellaneous includes cooperage logs, poles and pilings, fence posts, hewn ties, round mine timbers, box bolts, excelsior bolts, chemical wood, shingle bolts, log and pulp chip exports, and other products not specified.

**Table 7.16 Logging Residues from U.S. Growing Stock and Timber Product Output from U.S. Nongrowing Stock, 1952-1991**

Year	Logging residues		Output from nongrowing stock	
	Soft-wood	Hard-wood	Soft-wood	Hard-wood
	% of timber product removals from growing stock		% of timber supplies	
1952	9.8	22.2	10.4	20.9
1962	9.6	20.7	10.0	18.5
1970	10.0	19.7	7.0	13.9
1976	8.4	17.1	6.9	14.0
1986	9.0	13.2	11.5	38.5
1991	7.5	12.0	11.9	37.5

**Sources:** Haynes, R.W., D.M. Adams and J.R. Mills, *The 1993 RPA Timber Assessment Update*, Table 7, p. 16, and Table 8, p. 17 (U.S. Department of Agriculture, Forest Service, Washington, DC, 1995).

**Notes:** Logging residues are lower quality material, such as small stem, chunks, and low-quality stems. Declining amounts of residues reflect increased stumpage prices, improved logging technology, and increased demand for wood products. Timber supplies from nongrowing stock include salvable dead trees, rough and rotten trees, tops and limbs, defective sections of growing stock trees in urban areas, along fence rows, and on forested lands other than timberlands. Output from these sources has been greatly influenced by markets for pulpwood and fuelwood since the late 1970s.

**Table 7.17 U.S. Wildland Fire Damage and Tree Planting, Ten-Year Intervals, 1930-1950, and Annually, 1951-1997**

Year	Wildland fire damage	Tree planting	Year	Wildland fire damage	Tree planting
	..... million acres .....	..... million acres .....		..... million acres .....	..... million acres .....
1930	52.3	0.14	1973	1.9	1.75
1940	25.9	0.52	1974	2.9	1.60
1950	15.5	0.50	1975	1.8	1.93
1951	10.8	0.45	1976	5.1	1.89
1952	14.2	0.52	1977	3.2	1.98
1953	10.0	0.71	1978	3.9	2.09
1954	8.8	0.81	1979	3.0	2.06
1955	8.1	0.78	1980	5.3	2.27
1956	6.6	0.89	1981	4.8	2.35
1957	3.4	1.14	1982	2.4	2.37
1958	3.3	1.53	1983	5.1	2.45
1959	4.2	2.12	1984	3.0	2.55
1960	4.5	2.14	1985	5.2	2.70
1961	3.0	1.76	1986	3.2	2.75
1962	4.1	1.37	1987	5.0	3.03
1963	7.1	1.33	1988	5.7	3.39
1964	4.2	1.31	1989	3.5	3.02
1965	2.7	1.29	1990	4.6	2.86
1966	4.6	1.28	1991	2.2	2.56
1967	4.7	1.37	1992	2.6	2.55
1968	4.2	1.44	1993	2.3	2.42
1969	6.7	1.43	1994	4.7	2.78
1970	3.3	1.60	1995	2.3	2.42
1971	4.3	1.69	1996	6.7	2.41
1972	2.6	1.68	1997	3.7	2.49

**Sources:** U.S. Department of Agriculture, Forest Service, Fire and Aviation management, 1991-1997 *Wildland Fire Statistics* (USDA, FS, Washington, DC, 1998) and earlier reports in this series.

--, U.S. *Forest Planting Report* (USDA, FS, Washington, DC, annual).

**Notes:** Tree planting refers to acres planted in seedlings and direct seeded. Year = calendar year for wildland fire damage and fiscal year for tree planting.

**Table 7.18 U.S. Forestland Damaged by Insects, 1968-1997**

Year	Spruce budworm	Western spruce budworm	Gypsy moth	Mountain pine beetle	Southern pine beetle
..... million acres .....					
1968	1.3	5.3	0.1	na	na
1969	1.2	4.6	0.3	na	na
1970	2.0	4.0	1.0	na	na
1971	1.6	4.8	1.9	na	na
1972	2.8	5.5	1.4	na	na
1973	4.2	4.4	1.8	na	na
1974	10.8	5.5	0.8	na	na
1975	9.2	5.3	0.5	na	na
1976	9.1	5.8	0.9	na	na
1977	10.3	6.5	1.6	na	na
1978	7.7	5.2	1.3	4.0	na
1979	6.6	5.0	0.6	4.4	15.0
1980	6.6	4.0	5.0	4.7	12.1
1981	4.5	5.5	12.9	4.7	0.9
1982	4.2	8.7	8.2	4.2	7.3
1983	6.5	11.0	2.4	3.6	11.4
1984	6.1	10.6	1.0	3.3	na
1985	5.2	12.8	1.7	3.3	15.5
1986	1.0	13.2	2.4	3.5	26.4
1987	0.8	8.0	1.3	2.4	13.8
1988	0.3	6.1	0.7	2.2	7.9
1989	0.2	3.1	3.0	1.6	5.3
1990	0.2	4.6	7.3	0.9	4.2
1991	0.1	7.2	4.2	0.6	10.7
1992	0.1	4.6	3.1	15.8	14.3
1993	0.1	0.5	1.8	0.8	10.4
1994	1.0	0.5	0.9	0.4	5.3
1995	0.8	0.5	1.4	0.6	21.7
1996	0.5	0.3	0.2	0.3	7.3
1997	0.4	0.4	(s)	0.3	8.5

**Sources:** U.S. Department of Agriculture, Forest Service, *Forest Insect and Disease Conditions in the United States, 1979-1983* (USDA, FS, Washington, DC, 1985).

--, *Forest Insect and Disease Conditions in the United States* (USDA, FS, Washington, DC, annual from 1986).

**Notes:** na = not available. (s) = 47,300 acres; lowest acreage since 1959. Acreage for spruce budworm from 1991 forward includes spruce budworm in Alaska since it is the same species of budworm as in the eastern United States (i.e., it is not the western spruce budworm). Mountain pine beetle data for 1992 includes 15.2 million acres in California not previously reported.

# Pollution Prevention, Recycling, Toxics and Waste

**Table 8.1 U.S. Municipal Solid Waste Trends, 1960-1996**

Year	Gross discards	Recovery for recycling	Recovery for composting	Net discards million tons	Combustion	Discards to landfills	Per capita waste generation lbs/day
1960	88.12	5.61	**	82.51	27.00	55.51	2.68
1970	121.06	8.02	**	113.04	25.10	87.94	3.25
1980	151.64	14.52	**	137.12	13.70	123.42	3.66
1990	205.21	29.38	4.20	171.63	31.90	139.73	4.51
1996	209.66	46.01	11.32	152.33	36.09	116.24	4.33

**Source:** U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. *Characterization of Municipal Solid Waste in the United States: 1997 Update*, Table 34, p. 119 and Table B-2, p. 162 (EPA, Washington, DC, 1998).

**Note:** \*\*Negligible (less than 500,000 tons).

**Table 8.2 U.S. Municipal Solid Waste Trends by Waste Type, 1960-1996**

Year	Paper		Glass		Metals*		Aluminum		Plastics		Rubber and leather	
	Gen-eration	Re-cov-ery	Gen-eration	Re-cov-ery								
million tons												
1960	29.99	5.08	6.72	0.10	10.48	0.05	0.34	**	0.39	**	1.84	0.33
1970	44.31	6.77	12.74	0.16	13.03	0.48	0.80	0.01	2.90	**	2.97	0.25
1980	55.16	11.74	15.13	0.75	13.78	0.91	1.73	0.31	6.83	0.02	4.20	0.13
1990	72.73	20.23	13.10	2.62	13.74	3.31	2.81	1.01	17.13	0.37	5.79	0.37
1996	79.93	32.61	12.35	3.17	13.09	5.34	2.98	1.02	19.76	1.06	6.20	0.59
million tons												
Year	Textiles		Wood		Other		Food		Yard		Miscel-aneous	
	Gen-eration	Re-cov-ery	Gen-eration	Re-cov-ery								
million tons												
1960	1.76	0.05	3.03	**	0.07	**	12.20	**	20.00	**	1.30	**
1970	2.04	0.06	3.72	**	0.77	0.30	12.80	**	23.20	**	1.78	**
1980	2.53	0.16	7.01	**	2.52	0.50	20.00	**	27.50	**	2.25	**
1990	5.81	0.67	12.21	0.13	3.19	0.68	13.20	**	35.00	4.20	2.90	**
1996	7.76	0.95	10.84	0.49	3.69	0.78	21.90	0.52	29.75	10.80	3.20	**

**Source:** U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. *Characterization of Municipal Solid Waste in the United States: 1997 Update*, Table 1, p. 27 and Table 2, p. 28 (EPA, Washington, DC, 1998).

**Notes:** \*Ferrous and other nonferrous metals except aluminum. \*\*Negligible (less than 5,000 tons). Other includes electrolytes in batteries and disposable paper diapers.

**Table 8.3 U.S. Inventory of Low-level Nuclear Waste, 1965-1997**

Year	Commercial low-level nuclear waste shipped for disposal					
	Volume million cubic meters	Radioactivity million curies	Year	Volume million cubic meters	Radioactivity million curies	
1965	0.034	0.273	1982	0.929	4.568	
1966	0.049	0.355	1983	1.007	4.732	
1967	0.071	0.428	1984	1.083	4.954	
1968	0.091	0.529	1985	1.160	5.282	
1969	0.112	0.687	1986	1.213	5.059	
1970	0.138	0.855	1987	1.265	4.924	
1971	0.169	2.000	1988	1.306	4.793	
1972	0.208	2.287	1989	1.352	5.284	
1973	0.255	2.732	1990	1.387	4.979	
1974	0.309	2.754	1991	1.426	5.272	
1975	0.367	3.040	1992	1.476	5.708	
1976	0.442	3.268	1993	1.499	5.709	
1977	0.514	3.765	1994	1.524	5.841	
1978	0.593	4.383	1995	1.544	5.376	
1979	0.676	4.539	1996	1.551	5.020	
1980	0.768	4.547	1997	1.560	5.030	
1981	0.852	4.483				

**Source:** U.S. Department of Energy, Office of Environmental Management, *Integrated Data Base Report - 1996: U.S. Spent Fuel and Radioactive Waste Inventories, Projections, and Characteristics*, Revision 13 (DOE, EM, Washington, DC, December 1997).

**Notes:** Volumes and radioactivity are cumulative. Radioactivity added each year is decayed. Data for 1997 are projections.

**Table 8.4 U.S. Inventory of High-level Nuclear Waste, 1980-1997**

Year	Volume		Radioactivity		Year	Volume	Radioactivity
	thousand cubic meters	million curies	thousand cubic meters	million curies			
1980	329.7	1,362.6	1989	381.1	1,113.9		
1981	339.3	1,628.5	1990	372.3	1,050.8		
1982	342.0	1,369.4	1991	370.7	1,007.4		
1983	352.7	1,299.7	1992	370.7	1,081.2		
1984	363.5	1,355.2	1993	375.4	1,045.3		
1985	357.1	1,459.5	1994	354.8	958.8		
1986	365.9	1,419.0	1995	349.5	915.4		
1987	381.4	1,303.1	1996	347.3	894.8		
1988	384.9	1,206.7	1997	341.7	847.8		

**Source:** U.S. Department of Energy, Office of Environmental Management, *Integrated Data Base Report - 1996: U.S. Spent Fuel and Radioactive Waste Inventories, Projections, and Characteristics*, Revision 13 (DOE, EM, Washington, DC, December 1997).

**Notes:** Volumes and radioactivity are cumulative. Radioactivity added each year is decayed. Data for 1997 are projections.

**Table 8.5 U.S. Inventory of Spent Nuclear Fuel by Reactor Type, 1971-1996**

Year	Boiling-water reactors		Pressurized-water reactors		Total light-water reactors	
	Annual	Cumulative	Annual	Cumulative	Annual	Cumulative
..... metric tons initial heavy metal .....						
1971	65	81	44	83	109	164
1972	146	226	100	183	246	410
1973	94	320	67	250	161	570
1974	242	562	208	458	449	1,020
1975	226	787	322	780	548	1,567
1976	298	1,085	401	1,181	699	2,266
1977	383	1,469	467	1,648	850	3,116
1978	384	1,852	699	2,346	1,082	4,199
1979	400	2,252	721	3,068	1,121	5,320
1980	620	2,872	618	3,686	1,238	6,558
1981	459	3,331	676	4,362	1,135	7,692
1982	357	3,688	640	5,002	998	8,690
1983	491	4,179	771	5,773	1,263	9,952
1984	498	4,677	841	6,614	1,339	11,291
1985	532	5,209	861	7,475	1,393	12,684
1986	458	5,667	996	8,472	1,454	14,139
1987	597	6,264	1,109	9,581	1,706	15,844
1988	536	6,799	1,117	10,697	1,652	17,497
1989	698	7,497	1,215	11,913	1,913	19,410
1990	633	8,130	1,504	13,417	2,137	21,547
1991	588	8,718	1,271	14,688	1,859	23,406
1992	695	9,413	1,596	16,284	2,291	25,697
1993	700	10,113	1,532	17,816	2,232	27,929
1994	675	10,788	1,207	19,024	1,882	29,811
1995	627	11,415	1,514	20,538	2,141	31,952
1996	690	12,105	1,610	22,148	2,300	34,252

**Source:** U.S. Department of Energy, Office of Environmental Management, *Integrated Data Base Report - 1996: U.S. Spent Fuel and Radioactive Waste Inventories, Projections, and Characteristics*, Revision 13 (DOE, EM, Washington, DC, December 1997).

**Note:** Data for 1996 excludes 70 MTIHM of discharged fuel assemblies that are expected to be reinserted.

**Table 8.6 U.S. Toxics Release Inventory Releases and Transfers, 1988 and 1994-1996**

	1988	1994	1995	1996	1988-1996 change percent
	pounds				
<b>On-site releases</b>					
Air	2,180,862,321	1,280,285,817	1,191,260,290	1,095,413,106	-49.8
Fugitive air	680,928,993	351,433,000	304,738,454	276,183,228	-59.4
Point source air	1,499,933,328	928,852,817	886,521,836	819,229,878	-45.4
Surface water	164,551,386	39,794,843	35,918,865	45,144,135	-72.6
Underground	161,969,132	114,135,765	139,908,494	118,222,387	-27.0
Land	459,114,111	289,341,251	272,424,588	299,979,550	-34.7
Total	2,966,496,950	1,723,557,676	1,639,512,237	1,558,759,178	-47.5
<b>Off-site releases</b>					
To disposal	386,461,584	259,228,230	255,777,935	265,005,866	-31.4
Total releases	3,352,958,534	1,982,785,906	1,895,290,172	1,823,765,044	-45.6
<b>Other on-site waste mgt.</b>					
Recycled	na	6,518,368,024	6,139,069,594	6,209,509,900	na
Energy recovery	na	3,138,177,326	2,688,189,212	2,585,785,910	na
Treated	na	4,566,261,474	4,855,675,960	5,246,425,791	na
Total	na	14,222,806,824	13,682,934,766	14,041,721,601	na
<b>Transfers off-site</b>					
To recycling	na	2,200,760,073	2,173,558,832	2,094,268,207	na
To energy recovery	na	459,576,125	488,954,630	446,487,845	na
To treatment	369,204,491	221,230,371	236,496,866	248,020,028	-32.8
To POTWs	254,808,420	159,934,847	155,173,872	141,995,045	-44.3
To other	43,279,087	5,094,462	2,186,886	3,078,759	na
Total	na	3,046,595,878	3,056,371,086	2,933,849,884	na

**Source:** U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics, 1996 Toxics Release Inventory: Public Data Release (EPA, Washington, DC, 1998).

**Notes:** na = not available. Data do not include delisted chemicals, chemicals added in 1994-96, and aluminum oxide, ammonia, hydrochloric acid, and sulfuric acid. Transfers for recycling or energy recovery were not required to be reported in 1988. For 1994-96, other includes transfers reported without a valid waste management code.

**Table 8.7 U.S. Toxics Release Inventory On-site and Off-site Releases by Industry, 1988 and 1994-1996**

Industry	1988	1994	1995	1996	1988-1996	
					pounds	change percent
Food	8,377,717	6,013,560	5,120,357	5,120,503	-38.9	
Tobacco	341,927	134,771	95,226	73,415	-78.5	
Textiles	35,798,377	16,346,332	15,655,607	15,280,411	-57.3	
Apparel	1,025,697	1,380,947	1,259,986	1,741,831	69.8	
Lumber	32,981,807	32,986,266	30,434,637	27,116,641	-17.8	
Furniture	62,363,120	52,134,945	41,530,300	35,651,541	-42.8	
Paper	207,603,004	185,334,196	178,774,984	172,799,131	-16.8	
Printing	61,187,518	34,386,679	30,895,852	28,269,786	-53.8	
Chemicals	1,047,782,223	537,482,685	539,600,255	513,043,111	-51.0	
Petroleum	72,780,821	46,877,100	42,593,318	43,076,652	-40.8	
Plastics	158,313,799	125,462,108	114,765,358	105,358,191	-33.4	
Leather	13,023,617	5,104,391	4,026,421	3,813,502	-70.7	
Stone/Clay/Glass	40,539,364	17,359,182	19,053,390	23,263,716	-42.6	
Primary Metals	629,353,951	433,885,649	455,029,353	496,662,641	-21.1	
Fabricated Metals	160,369,759	99,572,056	90,440,941	77,610,533	-51.6	
Machinery	69,747,296	27,120,215	22,851,633	19,162,054	-72.5	
Electrical Equip.	132,719,036	36,671,754	31,457,129	33,753,037	-74.6	
Transportation Equip.	208,391,846	128,139,353	114,746,256	105,231,558	-49.5	
Measure./Photo	58,084,824	14,328,227	12,955,213	10,358,619	-82.2	
Miscellaneous	32,592,710	15,350,168	13,285,855	9,843,403	-69.8	
Multiple Codes 20-39	308,351,079	149,011,079	122,436,826	91,157,789	-70.4	
No Codes 20-39	11,229,042	17,704,243	8,281,275	5,376,979	-52.1	
Total	3,352,958,534	1,982,785,906	1,895,290,172	1,823,765,044	-45.6	
Federal Facilities	na	7,920,210	5,907,355	4,091,563	n/a	

**Source:** U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics, 1996 Toxics Release Inventory: Public Data Release (EPA, Washington, DC, 1998).

**Notes:** na = not available. n/a = not applicable.

**Table 8.8 U.S. Toxics Release Inventory On-site and Off-site Releases by State, 1988 and 1994-1996**

State	1988	1994	1995	1996	1988-1996 change percent
	pounds				
Alabama	109,689,614	96,649,203	100,495,399	89,468,520	-18.4
Alaska	3,714,569	1,095,396	2,164,144	1,683,698	-54.7
American Samoa	0	0	0	0	n/a
Arizona	66,236,322	30,774,930	33,875,255	46,258,274	-30.2
Arkansas	41,078,310	29,329,078	24,494,563	22,915,254	-44.2
California	109,318,413	42,361,649	36,146,068	30,988,706	-71.7
Colorado	15,736,129	4,080,707	3,489,143	3,690,197	-76.5
Connecticut	37,799,558	11,219,092	8,643,867	6,387,666	-83.1
Delaware	8,635,152	4,096,180	2,902,307	1,986,174	-77.0
District of Columbia	500	55,560	56,965	9,460	1,792.0
Florida	61,526,840	71,434,211	52,110,580	46,914,430	-23.7
Georgia	86,766,834	43,827,310	39,791,760	38,467,754	-55.7
Guam	0	0	3,100	3,000	n/a
Hawaii	847,805	531,471	562,284	448,355	-47.1
Idaho	7,348,539	9,148,741	10,081,185	10,752,902	46.3
Illinois	134,593,529	89,071,039	82,881,648	76,549,404	-43.1
Indiana	184,554,149	82,653,253	88,801,423	91,418,953	-50.5
Iowa	43,027,871	22,728,352	21,124,247	17,499,568	-59.3
Kansas	30,301,296	17,408,245	17,611,936	17,569,997	-42.0
Kentucky	66,443,750	32,512,132	30,569,980	30,940,570	-53.4
Louisiana	250,845,496	114,823,665	122,286,440	129,789,110	-48.3
Maine	15,355,970	6,879,400	6,593,629	5,273,360	-65.7
Maryland	20,037,261	11,450,775	11,857,911	9,380,959	-53.2
Massachusetts	31,878,653	9,950,179	8,351,331	8,951,366	-71.9
Michigan	132,693,208	103,054,956	85,889,256	78,425,842	-40.9
Minnesota	55,947,771	20,825,514	18,338,087	15,846,403	-71.7
Mississippi	59,600,174	42,834,108	39,671,257	39,321,344	-34.0
Missouri	90,703,961	56,771,910	50,552,453	49,769,859	-45.1
Montana	35,629,903	46,459,564	42,643,724	47,204,182	32.5
Nebraska	16,935,710	13,734,915	11,171,399	8,880,693	-47.6
Nevada	2,352,366	3,208,708	3,368,990	3,294,005	40.0
New Hampshire	13,865,650	2,394,720	1,939,853	1,749,609	-87.4
New Jersey	45,018,440	14,024,665	12,399,476	10,644,699	-76.4
New Mexico	30,386,119	17,230,438	17,945,764	18,339,076	-39.6
New York	99,656,137	37,901,900	30,361,469	26,028,249	-73.9
North Carolina	132,027,139	80,752,697	72,492,552	67,973,108	-48.5
North Dakota	1,195,389	987,938	1,206,622	772,995	-35.3
Ohio	202,151,571	116,095,889	122,236,396	115,227,944	-43.0
Oklahoma	32,894,841	15,344,174	15,995,029	15,215,680	-53.7

See next page for continuation of table.

**Table 8.8 U.S. Toxics Release Inventory On-site and Off-site Releases by State, 1988 and 1994-1996 (continued)**

State	1988	1994	1995	1996	1988-1996 change percent
	pounds				
Oregon*	21,562,415	18,011,164	18,448,805	24,647,444	14.3
Pennsylvania	134,852,351	95,109,558	95,914,412	90,528,698	-32.9
Puerto Rico	12,828,707	9,693,032	8,840,075	7,467,738	-41.8
Rhode Island	7,712,568	6,789,350	3,017,334	2,452,269	-68.2
South Carolina	66,070,190	47,639,871	48,112,037	47,373,602	-28.3
South Dakota	2,393,242	2,108,149	1,871,676	1,364,448	-43.0
Tennessee	126,484,405	104,914,555	94,684,331	88,190,525	-30.3
Texas	318,631,665	199,765,449	205,724,168	187,485,411	-41.2
Utah	123,835,686	67,175,197	69,143,942	73,876,112	-40.3
Vermont	1,734,453	631,876	543,553	293,732	-83.1
Virgin Islands	2,592,912	1,516,211	1,235,660	1,232,271	-52.5
Virginia	112,328,804	43,828,869	40,612,569	40,555,452	-63.9
Washington	28,273,090	20,770,473	22,336,381	21,889,503	-22.6
West Virginia	39,415,713	20,852,490	19,678,685	17,444,543	-55.7
Wisconsin	60,706,773	39,396,974	32,874,642	31,565,607	-48.0
Wyoming	16,740,621	880,024	1,144,410	1,356,324	-91.9
Total	3,352,958,534	1,982,785,906	1,895,290,172	1,823,765,044	-45.6

**Source:** U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics, 1996 Toxics Release Inventory: Public Data Release (EPA, Washington, DC, 1998).

**Notes:** n/a = not applicable. Oregon reported 6,211,171 pounds of fugitive air emissions in error for 1996 (included in table above); the correct amount is 750 pounds. The change for Oregon should be a decrease of 3,125,392 pounds or -14.5 percent

**Table 8.9 U.S. Superfund Inventory, 1980-1997**

Year	Superfund ..... <i>number of sites</i>	NPL
1980	8,689	0
1981	13,893	0
1982	14,697	160
1983	16,023	551
1984	18,378	547
1985	22,238	864
1986	24,940	906
1987	27,274	967
1988	29,809	1,195
1989	31,650	1,254
1990	33,371	1,236
1991	35,108	1,245
1992	36,869	1,275
1993	38,169	1,321
1994	39,099	1,360
1995	15,622	1,374
1996	12,781	1,210
1997	9,245	1,194

**Source:** U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, *Superfund Cleanup Figures* (an Internet accessible report; April 1, 1998).

**Notes:** NPL = National Priorities List. The 1995 data reflect the removal of over 24,000 sites from the Superfund inventory as part of EPA's Brownfields initiative to help promote economic redevelopment of these properties.

**Table 8.10 Contaminant Levels in Herring Gull Eggs from Great Lakes Colonies, 1974-1996**

Year	Lake Superior				
	DDE	Dieldrin	Mirex	HCB	PCBs
..... <i>parts per million in whole egg samples, wet weight</i> .....					
1974	16.59	0.51	1.04	0.26	62.08
1975	23.10	0.38	0.96	0.18	76.24
1976	na	na	na	na	na
1977	11.92	0.38	0.33	0.24	55.22
1978	9.64	0.39	0.28	0.12	41.57
1979	6.83	0.60	0.26	0.14	58.74
1980	3.67	0.34	0.13	0.08	25.58
1981	5.74	0.44	0.14	0.12	33.84
1982	6.29	0.39	0.37	0.08	34.74
1983	3.17	0.33	0.15	0.05	21.42
1984	2.94	0.36	0.12	0.05	16.91
1985	3.13	0.32	0.11	0.05	15.89
1986	3.22	0.34	0.11	0.05	14.10
1987	2.52	0.20	0.10	0.04	12.35
1988	2.94	0.34	0.06	0.05	13.43
1989	2.50	0.34	0.07	0.05	15.09
1990	2.64	0.30	0.06	0.03	11.62
1991	3.60	0.27	0.07	0.04	14.09
1992	3.69	0.40	0.07	0.05	13.95
1993	4.09	0.19	0.08	0.03	15.70
1994	2.39	0.15	0.10	0.03	12.30
1995	2.49	0.11	0.08	0.02	11.15
1996	2.88	0.15	0.08	0.04	12.60

See next page for continuation of table.

**Table 8.10 Contaminant Levels in Herring Gull Eggs from Great Lakes Colonies, 1974-1996 (continued)**

Year	Lake Michigan				
	DDE	Dieldrin	Mirex	HCB	PCBs
..... <i>parts per million in whole egg samples, wet weight</i> .....					
1974	na	na	na	na	na
1975	na	na	na	na	na
1976	33.40	0.82	0.36	0.14	118.42
1977	29.25	0.68	0.14	0.24	107.80
1978	22.36	0.87	0.21	0.12	90.74
1979	na	na	na	na	na
1980	12.17	0.70	0.10	0.09	57.83
1981	na	na	na	na	na
1982	15.86	0.81	0.09	0.09	65.41
1983	6.46	0.61	0.05	0.05	30.27
1984	7.85	0.53	0.09	0.06	31.47
1985	6.98	0.47	0.12	0.05	31.94
1986	7.48	0.38	0.07	0.07	27.25
1987	3.95	0.33	0.06	0.04	16.58
1988	5.04	0.55	0.03	0.04	19.14
1989	4.74	0.54	0.04	0.04	21.00
1990	8.12	0.54	0.06	0.05	32.19
1991	10.52	0.34	0.12	0.05	31.27
1992	6.71	0.41	0.04	0.04	20.25
1993	na	na	na	na	na
1994	10.10	0.34	0.08	0.05	32.85
1995	6.38	0.19	0.05	0.03	23.30
1996	6.10	0.21	0.08	0.04	22.70

See next page for continuation of table.

**Table 8.10 Contaminant Levels in Herring Gull Eggs from Great Lakes Colonies, 1974-1996 (continued)**

Year	Lake Huron				
	DDE	Dieldrin	Mirex	HCB	PCBs
..... <i>parts per million in whole egg samples, wet weight</i> .....					
1974	17.40	0.50	1.34	0.38	71.01
1975	14.03	0.36	0.51	0.21	42.67
1976	na	na	na	na	na
1977	16.17	0.54	0.44	0.36	70.28
1978	6.53	0.22	0.21	0.11	32.38
1979	2.30	0.30	0.19	0.10	28.66
1980	2.71	0.24	0.11	0.07	20.41
1981	3.82	0.24	0.26	0.07	25.39
1982	4.43	0.28	0.48	0.08	34.29
1983	2.74	0.22	0.15	0.05	18.28
1984	2.56	0.22	0.34	0.07	19.95
1985	2.77	0.30	0.22	0.06	16.90
1986	2.05	0.21	0.12	0.05	12.00
1987	1.32	0.22	0.08	0.02	8.33
1988	1.40	0.22	0.07	0.04	8.83
1989	1.57	0.20	0.09	0.03	10.19
1990	1.86	0.14	0.11	0.03	11.34
1991	1.97	0.16	0.11	0.03	10.00
1992	2.36	0.16	0.05	0.05	10.20
1993	3.18	0.19	0.06	0.03	10.95
1994	2.19	0.13	0.10	0.03	11.25
1995	1.60	0.10	0.06	0.03	8.95
1996	2.01	0.13	0.14	0.08	10.05

See next page for continuation of table.

**Table 8.10 Contaminant Levels in Herring Gull Eggs from Great Lakes Colonies, 1974-1996 (continued)**

Year	Lake Erie				
	DDE	Diethyltin	Mirex	HCB	PCBs
..... parts per million in whole egg samples, wet weight .....					
1974	7.13	0.35	0.64	0.29	72.46
1975	7.41	0.33	0.32	0.19	62.30
1976	na	na	na	na	na
1977	7.49	0.40	0.45	0.37	68.70
1978	4.29	0.24	0.20	0.09	44.43
1979	3.10	0.25	0.17	0.11	48.44
1980	2.98	0.21	0.18	0.09	46.38
1981	3.90	0.22	0.25	0.09	56.49
1982	3.07	0.25	0.13	0.08	58.89
1983	2.39	0.20	0.17	0.05	37.31
1984	3.23	0.33	0.22	0.06	46.20
1985	2.83	0.19	0.14	0.06	38.41
1986	2.77	0.23	0.14	0.06	33.35
1987	1.77	0.14	0.12	0.03	23.16
1988	2.07	0.17	0.10	0.05	27.50
1989	2.69	0.17	0.18	0.05	39.21
1990	2.01	0.10	0.11	0.03	30.09
1991	2.12	0.08	0.07	0.02	26.55
1992	1.68	0.13	0.05	0.04	24.45
1993	1.49	0.10	0.07	0.02	21.70
1994	1.55	0.08	0.08	0.03	22.90
1995	1.21	0.08	0.07	0.03	23.55
1996	1.25	0.06	0.09	0.03	15.50

See next page for continuation of table.

**Table 8.10 Contaminant Levels in Herring Gull Eggs from Great Lakes Colonies, 1974-1996 (continued)**

Year	Lake Ontario				
	DDE	Dieldrin	Mirex	HCB	PCBs
parts per million in whole egg samples, wet weight					
1974	22.30	0.47	6.99	0.58	152.37
1975	22.80	0.29	4.70	0.33	143.11
1976	na	na	na	na	na
1977	14.88	0.39	2.48	0.80	102.50
1978	10.65	0.26	1.59	0.32	72.43
1979	8.94	0.21	1.89	0.21	69.60
1980	7.62	0.19	1.65	0.17	56.43
1981	11.00	0.28	2.67	0.24	78.90
1982	10.04	0.28	3.05	0.16	62.90
1983	4.78	0.18	1.43	0.08	42.59
1984	6.26	0.21	1.87	0.12	51.11
1985	6.02	0.15	1.47	0.07	35.58
1986	4.41	0.16	1.10	0.07	27.86
1987	2.60	0.13	0.68	0.04	16.48
1988	4.25	0.15	0.82	0.07	23.53
1989	5.28	0.22	1.15	0.07	32.45
1990	3.36	0.10	0.64	0.03	18.44
1991	3.53	0.14	0.58	0.03	17.05
1992	5.01	0.13	0.77	0.05	21.20
1993	5.27	0.13	0.82	0.04	21.05
1994	3.83	0.13	0.80	0.04	19.70
1995	2.23	0.05	0.57	0.02	13.60
1996	3.03	0.10	0.68	0.04	16.15

**Source:** Environment Canada, Canadian Wildlife Service, Canada Centre for Inland Waters, Organochlorine Contaminant Concentrations in Herring Gull Eggs from Great Lakes Colonies, unpublished, Burlington, ON, 1996.

**Notes:** DDE = Derivative of Dichloro-diphenyl-trichloro ethane (DDT). HCB = Hexachlorobenzene. PCBs = Polychlorinated biphenyls. na = not available. Data for Lake Michigan for 1996 are based on only one count per sampling site.

**Table 8.11 Pesticide Residues in U.S. Domestic Surveillance Food Samples by Commodity Group, 1978-1997**

Year	Commodity group						Total
	Grains & grain products	Milk, dairy products & eggs	Fish, shellfish & meats	Fruits	Vegetables	Other	
	percentage of samples without residues found						
1978	46	57	20	52	66	58	53
1979	46	53	19	42	65	53	51
1980	48	64	29	47	60	64	54
1981	57	68	23	44	63	66	56
1982	58	66	28	51	64	68	59
1983	58	68	39	48	59	69	57
1984	46	69	25	62	67	69	63
1985	48	78	35	64	66	78	65
1986	40	79	32	43	61	52	56
1987	43	76	27	50	63	63	58
1988	51	81	28	49	65	72	60
1989	56	87	35	56	68	80	65
1990	54	91	32	51	62	79	60
1991	58	78	58	49	68	81	64
1992	61	94	48	51	69	81	65
1993	66	94	53	70	39	83	64
1994	61	93	59	44	66	88	63
1995	33	100	80	48	48	80	54
1996	53	97	62	46	64	75	64
1997	60	97	68	44	69	83	66

**Source:** U.S. Department of Health and Human Services, Food and Drug Administration, *Pesticide Program Residues Monitoring 1997* (HHS, FDA, Washington, DC, 1998) and earlier annual reports.

**Notes:** Domestic food samples are collected as close as possible to the point of production. Fresh produce is analyzed as the unwashed whole, raw commodity. Although a percentage of samples contain pesticide residues, the percent of samples with over-tolerance residues (as set by EPA) is low. Between 1973 and 1986; 3 percent of samples were classed as violative; between 1987 and 1996 less than 1 percent were violative; and in 1997, 1.2 percent were violative.

**Table 8.12 U.S. Production of Selected Ozone-depleting Chemicals, 1958-1994**

Year	CFC-11	CFC-12	HCFC-22	CFC-113	$\text{CH}_3\text{CCl}_3$
<i>..... thousand metric tons of CFC-11 equivalent .....</i>					
1958	22.9	59.6	0.76	0.0	0.0
1959	27.4	71.3	0.83	0.0	0.0
1960	32.8	75.5	0.91	1.6	0.0
1961	41.2	78.7	1.03	2.4	0.0
1962	56.6	94.3	1.12	3.2	0.0
1963	63.6	98.6	1.23	3.6	0.0
1964	67.4	103.4	1.34	4.3	0.0
1965	77.3	123.1	1.46	5.1	0.0
1966	77.3	129.9	1.59	5.8	0.0
1967	82.7	140.5	1.78	7.6	13.7
1968	92.7	147.7	1.96	9.1	14.6
1969	108.2	166.8	2.14	10.9	15.6
1970	110.9	170.3	2.28	13.1	16.6
1971	117.0	176.7	2.55	15.6	17.4
1972	135.9	199.2	2.80	18.2	18.2
1973	151.4	221.7	3.09	21.4	19.0
1974	154.7	221.1	3.21	23.2	19.9
1975	122.3	178.3	2.99	24.8	20.8
1976	116.2	178.3	3.85	29.7	24.8
1977	96.4	162.3	4.07	36.2	28.8
1978	87.9	148.4	4.67	41.0	29.2
1979	75.8	133.3	4.78	47.0	32.5
1980	71.7	133.8	5.16	36.7	31.4
1981	73.8	147.6	5.71	38.6	27.9
1982	63.7	117.0	3.95	40.0	27.0
1983	73.1	134.3	5.35	42.2	26.6
1984	83.9	152.7	5.76	60.2	30.6
1985	79.7	136.9	5.34	65.8	39.4
1986	91.6	146.2	6.15	69.2	29.6
1987	89.7	151.9	6.23	72.3	31.5
1988	113.0	187.7	7.54	79.2	32.8
1989	83.3	141.2	7.24	80.4	35.5
1990	61.0	94.6	6.94	55.9	36.4
1991	44.9	71.3	7.13	47.2	29.2
1992	45.5	73.9	7.48	28.5	31.4
1993	32.8	83.7	6.61	11.4	20.5
1994	na	57.5	6.93	na	na

**Source:** U.S. International Trade Commission, *Synthetic Organic Chemicals, United States Production and Sales* (GPO, Washington, DC, annual).

**Notes:** CFC-11 = Trichlorofluoromethane. CFC-12 = Dichlorodifluoromethane. HCFC-22 = Chlorodifluoromethane. CFC-113 = Trichlorotrifluoroethane.  $\text{CH}_3\text{CCl}_3$  = Trichloroethane or methyl chloroform. This series ended after the publication of the 1994 data.

# Energy

**Table 9.1 Proved Reserves of Liquid and Gaseous Hydrocarbons in the United States, 1977-1997**

Year	Crude oil billion barrels	Natural gas trillion cubic feet	Natural gas liquids billion barrels
1977	31.8	207.4	na
1978	31.4	208.0	6.8
1979	29.8	201.0	6.6
1980	29.8	199.0	6.7
1981	29.4	201.7	7.1
1982	27.9	201.5	7.2
1983	27.7	200.5	7.9
1984	28.4	197.5	7.6
1985	28.4	193.4	7.9
1986	26.9	191.6	8.2
1987	27.3	187.2	8.1
1988	26.8	168.0	8.2
1989	26.5	167.1	7.8
1990	26.3	169.3	7.6
1991	24.7	167.1	7.5
1992	23.7	165.0	7.5
1993	23.0	162.4	7.2
1994	22.5	163.8	7.2
1995	22.4	165.1	7.4
1996	22.0	166.5	7.8
1997	22.6	167.2	7.9

**Source:** U.S. Department of Energy, Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves, 1997 Annual Report*, Table 1, p. 3 and Appendix D, Historical Reserves Statistics, DOE/EIA-0216(97) (GPO, Washington, DC, 1998).

**Table 9.2 U.S. Energy Production by Source, 1960-1997**

Year	Coal	Crude oil & NGPL	Natural gas	Hydro-electric power	Nuclear	Geothermal & other renewables	Total
..... quadrillion Btu .....							
1960	10.82	16.40	12.66	1.61	0.01	<0.01	41.49
1961	10.45	16.76	13.10	1.66	0.02	<0.01	41.99
1962	10.90	17.12	13.72	1.82	0.03	<0.01	43.58
1963	11.85	17.68	14.51	1.77	0.04	<0.01	45.85
1964	12.52	17.97	15.30	1.89	0.04	<0.01	47.72
1965	13.06	18.40	15.78	2.06	0.04	<0.01	49.34
1966	13.47	19.56	17.01	2.06	0.06	<0.01	52.17
1967	13.83	20.83	17.94	2.35	0.09	0.01	55.04
1968	13.61	21.63	19.07	2.35	0.14	0.01	56.81
1969	13.86	21.98	20.45	2.65	0.15	0.01	59.10
1970	14.61	22.91	21.67	2.63	0.24	0.01	62.07
1971	13.19	22.58	22.28	2.82	0.41	0.01	61.29
1972	14.09	22.64	22.21	2.86	0.58	0.03	62.42
1973	13.99	22.06	22.19	2.86	0.91	0.04	62.06
1974	14.07	21.05	21.21	3.18	1.27	0.05	60.84
1975	14.99	20.10	19.64	3.15	1.90	0.07	59.86
1976	15.65	19.59	19.48	2.98	2.11	0.08	59.89
1977	15.76	19.78	19.57	2.33	2.70	0.09	60.22
1978	14.91	20.68	19.49	2.94	3.02	0.06	61.10
1979	17.54	20.39	20.08	2.93	2.78	0.09	63.80
1980	18.60	20.50	19.91	2.90	2.74	0.11	64.76
1981	18.38	20.45	19.70	2.76	3.01	0.12	64.42
1982	18.64	20.50	18.32	3.27	3.13	0.11	63.96
1983	17.25	20.58	16.59	3.53	3.20	0.13	61.28
1984	19.72	21.12	18.01	3.39	3.55	0.17	65.96
1985	19.33	21.23	16.98	2.97	4.15	0.21	64.87
1986	19.51	20.53	16.54	3.07	4.47	0.23	64.35
1987	20.14	19.89	17.14	2.63	4.91	0.25	64.95
1988	20.74	19.54	17.60	2.33	5.66	0.24	66.11
1989	21.35	18.28	17.85	2.80	5.68	0.22	66.16
1990	22.46	17.75	18.36	3.00	6.16	3.06	70.78
1991	21.59	18.01	18.23	2.96	6.58	3.08	70.45
1992	21.59	17.59	18.38	2.58	6.61	3.25	69.98
1993	20.22	16.90	18.58	2.85	6.52	3.26	68.34
1994	22.07	16.49	19.35	2.65	6.84	3.32	70.71
1995	21.98	16.33	19.10	3.18	7.18	3.27	71.04
1996	22.65	16.25	19.30	3.56	7.17	3.39	72.32
1997	23.17	16.11	19.47	3.68	6.69	3.20	72.32

**Source:** U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 1997*, Table 1.2, p. 7, DOE/EIA-0384(97) (GPO, Washington, DC, 1998).

**Notes:** NGPL = Natural gas plant liquids. Hydroelectric includes pumped storage which represents total pumped storage facility production minus energy used for pumping. Other renewables include electricity produced from wood, waste, wind, and solar sources. There is a discontinuity in this time series between 1989 and 1990 due to expanded coverage of nonelectric utility use of renewable energy beginning in 1990. Previous-year data may have been revised. Current-year data are preliminary and may be revised in future publications.

**Table 9.3 U.S. Coal Production by Rank, Mining Method, and Location, 1960-1997**

Year	Rank			Mining method		Location			
	Bitum- inous	Subbi- tuminous	Lignite	Anthra- cite	Under- ground	Surface	West	East	Total
	million tons								
1960	415.5	i	i	18.8	292.6	141.7	21.3	413.0	434.3
1961	403.0	i	i	17.4	279.6	140.9	21.8	398.6	420.4
1962	422.1	i	i	16.9	287.9	151.1	21.4	417.6	439.0
1963	458.9	i	i	18.3	309.0	168.2	23.7	453.5	477.2
1964	487.0	i	i	17.2	327.7	176.5	25.7	478.5	504.2
1965	512.1	i	i	14.9	338.0	189.0	27.4	499.5	527.0
1966	533.9	i	i	12.9	342.6	204.2	28.0	518.8	546.8
1967	552.6	i	i	12.3	352.4	212.5	28.9	536.0	564.9
1968	545.2	i	i	11.5	346.6	210.1	29.7	527.0	556.7
1969	547.2	8.3	5.0	10.5	349.2	221.7	33.3	537.7	571.0
1970	578.5	16.4	8.0	9.7	340.5	272.1	44.9	567.8	612.7
1971	521.3	22.2	8.7	8.7	277.2	283.7	51.0	509.9	560.9
1972	556.8	27.5	11.0	7.1	305.0	297.4	64.3	538.2	602.5
1973	543.5	33.9	14.3	6.8	300.1	298.5	76.4	522.1	598.6
1974	545.7	42.2	15.5	6.6	278.0	332.1	91.9	518.1	610.0
1975	577.5	51.1	19.8	6.2	293.5	361.2	110.9	543.7	654.6
1976	588.4	64.8	25.5	6.2	295.5	389.4	136.1	548.8	684.9
1977	581.0	82.1	28.2	5.9	266.6	430.6	163.9	533.3	697.2
1978	534.0	96.8	34.4	5.0	242.8	427.4	183.0	487.2	670.2
1979	612.3	121.5	42.5	4.8	320.9	460.2	221.4	559.7	781.1
1980	628.8	147.7	47.2	6.1	337.5	492.2	251.0	578.7	829.7
1981	608.0	159.7	50.7	5.4	316.5	507.3	269.9	553.9	823.8
1982	620.2	160.9	52.4	4.6	339.2	499.0	273.9	564.3	838.1
1983	568.6	151.0	58.3	4.1	300.4	481.7	274.7	507.4	782.1
1984	649.5	179.2	63.1	4.2	352.1	543.9	308.3	587.6	895.9
1985	613.9	192.7	72.4	4.7	350.8	532.8	324.9	558.7	883.6
1986	620.1	189.6	76.4	4.3	360.4	529.9	325.9	564.4	890.3
1987	636.6	200.2	78.4	3.6	372.9	545.9	336.8	581.9	918.8
1988	638.1	223.5	85.1	3.6	382.2	568.1	370.7	579.6	950.3
1989	659.8	231.2	86.4	3.3	393.8	586.9	381.7	599.0	980.7
1990	693.2	244.3	88.1	3.5	424.5	604.5	398.9	630.2	1,029.1
1991	650.7	255.3	86.5	3.4	407.2	588.8	404.7	591.3	996.0
1992	651.8	252.2	90.1	3.5	407.2	590.3	409.0	588.6	997.5
1993	576.7	274.9	89.5	4.3	351.1	594.4	429.2	516.2	945.4
1994	640.3	300.5	88.1	4.6	399.1	634.4	467.2	566.3	1,033.5
1995	613.8	328.0	86.5	4.7	396.2	636.7	488.7	544.2	1,033.0
1996	630.8	340.3	88.1	4.8	409.8	654.0	500.2	563.7	1,063.9
1997	629.3	366.9	87.6	4.9	419.1	669.5	511.3	577.3	1,088.6

**Source:** U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 1997*, Table 7.2, p. 191, DOE/EIA-0384(97) (GPO, Washington, DC, 1998).

**Notes:** i = included in bituminous coal. Location refers to east and west of the Mississippi River. Totals may not agree with sum of components due to independent rounding. Previous-year data may have been revised. Current-year data are estimates and may be revised in future publications.

**Table 9.4 U.S. Petroleum Production and Net Imports, 1950-1997**

Year	Production			Net imports million barrels per day	Year	Production			Net imports million barrels per day
	Crude oil	NGPL	Total			Crude oil	NGPL	Total	
	million barrels per day					million barrels per day			
1950	5.41	0.50	5.91	0.55	1974	8.77	1.69	10.46	5.89
1951	6.16	0.56	6.72	0.42	1975	8.37	1.63	10.01	5.85
1952	6.27	0.61	6.87	0.52	1976	8.13	1.60	9.74	7.09
1953	6.46	0.65	7.11	0.63	1977	8.24	1.62	9.86	8.56
1954	6.34	0.69	7.03	0.70	1978	8.71	1.57	10.27	8.00
1955	6.81	0.77	7.58	0.88	1979	8.55	1.58	10.14	7.99
1956	7.15	0.80	7.95	1.01	1980	8.60	1.57	10.17	6.36
1957	7.17	0.81	7.98	1.01	1981	8.57	1.61	10.18	5.40
1958	6.71	0.81	7.52	1.42	1982	8.65	1.55	10.20	4.30
1959	7.05	0.88	7.93	1.57	1983	8.69	1.56	10.25	4.31
1960	7.04	0.93	7.96	1.61	1984	8.88	1.63	10.51	4.72
1961	7.18	0.99	8.17	1.74	1985	8.97	1.61	10.58	4.29
1962	7.33	1.02	8.35	1.91	1986	8.68	1.55	10.23	5.44
1963	7.54	1.10	8.64	1.91	1987	8.35	1.60	9.94	5.91
1964	7.61	1.16	8.77	2.06	1988	8.14	1.62	9.76	6.59
1965	7.80	1.21	9.01	2.28	1989	7.61	1.55	9.16	7.20
1966	8.30	1.28	9.58	2.37	1990	7.36	1.56	8.91	7.16
1967	8.81	1.41	10.22	2.23	1991	7.42	1.66	9.08	6.63
1968	9.10	1.51	10.60	2.61	1992	7.17	1.70	8.87	6.94
1969	9.24	1.59	10.83	2.93	1993	6.85	1.74	8.58	7.62
1970	9.64	1.66	11.30	3.16	1994	6.66	1.73	8.39	8.05
1971	9.46	1.69	11.16	3.70	1995	6.56	1.76	8.32	7.89
1972	9.44	1.74	11.18	4.52	1996	6.46	1.83	8.29	8.50
1973	9.21	1.74	10.95	6.02	1997	6.41	1.84	8.25	8.90

**Source:** U.S. Department of Energy, Energy Information Administration, *Annual Energy Review* 1997, Table 5.1, p. 117, DOE/EIA-0384(97) (GPO, Washington, DC, 1998).

**Notes:** Crude oil includes lease condensate. NGPL = Natural gas plant liquids. Net imports = imports minus exports. Previous-year data may have been revised. Current-year data are preliminary and may be revised in future publications.

**Table 9.5 U.S. Natural Gas Production, 1960-1997**

Year	Well withdrawals	Repressuring	Nonhydro-carbon gas removal	Vented and flared	Marketed production	Extraction loss	Total production
..... trillion cubic feet .....							
1960	15.09	1.75	na	0.56	12.77	0.54	12.23
1961	15.46	1.68	na	0.52	13.25	0.59	12.66
1962	16.04	1.74	na	0.43	13.88	0.62	13.25
1963	16.97	1.84	na	0.38	14.75	0.67	14.08
1964	17.54	1.65	na	0.34	15.55	0.72	14.82
1965	17.96	1.60	na	0.32	16.04	0.75	15.29
1966	19.03	1.45	na	0.38	17.21	0.74	16.47
1967	20.25	1.59	na	0.49	18.17	0.78	17.39
1968	21.33	1.49	na	0.52	19.32	0.83	18.49
1969	22.68	1.46	na	0.53	20.70	0.87	19.83
1970	23.79	1.38	na	0.49	21.92	0.91	21.01
1971	24.09	1.31	na	0.28	22.49	0.88	21.61
1972	24.02	1.24	na	0.25	22.53	0.91	21.62
1973	24.07	1.17	na	0.25	22.65	0.92	21.73
1974	22.85	1.08	na	0.17	21.60	0.89	20.71
1975	21.10	0.86	na	0.13	20.11	0.87	19.24
1976	20.94	0.86	na	0.13	19.95	0.85	19.10
1977	21.10	0.93	na	0.14	20.03	0.86	19.16
1978	21.31	1.18	na	0.15	19.97	0.85	19.12
1979	21.88	1.25	na	0.17	20.47	0.81	19.66
1980	21.87	1.37	0.20	0.13	20.18	0.78	19.40
1981	21.59	1.31	0.22	0.10	19.96	0.77	19.18
1982	20.27	1.39	0.21	0.09	18.58	0.76	17.82
1983	18.66	1.46	0.22	0.09	16.88	0.79	16.09
1984	20.27	1.63	0.22	0.11	18.30	0.84	17.47
1985	19.61	1.92	0.33	0.09	17.27	0.82	16.45
1986	19.13	1.84	0.34	0.10	16.86	0.80	16.06
1987	20.14	2.21	0.38	0.12	17.43	0.81	16.62
1988	21.00	2.48	0.46	0.14	17.92	0.82	17.10
1989	21.07	2.48	0.36	0.14	18.10	0.78	17.31
1990	21.52	2.49	0.29	0.15	18.59	0.78	17.81
1991	21.75	2.77	0.28	0.17	18.53	0.83	17.70
1992	22.13	2.97	0.28	0.17	18.71	0.87	17.84
1993	22.73	3.10	0.41	0.23	18.98	0.89	18.10
1994	23.58	3.23	0.41	0.23	19.71	0.89	18.82
1995	23.74	3.57	0.39	0.28	19.51	0.91	18.60
1996	24.05	3.51	0.52	0.27	19.75	0.96	18.79
1997	24.31	3.66	0.50	0.26	19.89	0.93	18.96

**Source:** U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 1997*, Table 6.2, p. 169, DOE/EIA-0384(97) (GPO, Washington, DC, 1998).

**Notes:** Withdrawals are from both gas and oil wells. Extraction loss refers to volume reduction resulting from the removal of natural gas plant liquids. Total production refers to dry natural gas. Beginning in 1965, all volumes are shown on a pressure base of 14.73 p.s.i.a. at 60 degrees F. Totals may not agree with sum of components due to independent rounding. Previous-year data may have been revised. Current-year data are preliminary and may be revised in future publications.

**Table 9.6 U.S. Electricity Utility Net Generation, 1960-1997**

Year	Coal	Natural gas	Petroleum	Nuclear electric power	Conventional hydro-electric power			Other renewable energy	Total
					Geo-thermal energy	hydro-electric power	Total		
..... <i>billion kilowatt-hours</i> .....									
1960	403.1	158.0	48.0	0.5	145.8	(s)	0.1	755.5	
1961	421.9	169.3	48.5	1.7	152.2	0.1	0.1	793.8	
1962	450.2	184.3	48.9	2.3	168.6	0.1	0.1	854.5	
1963	493.9	201.6	52.0	3.2	165.8	0.2	0.1	916.8	
1964	526.2	220.0	57.0	3.3	177.1	0.2	0.1	984.0	
1965	570.9	221.6	64.8	3.7	193.9	0.2	0.3	1,055.3	
1966	613.5	251.2	78.9	5.5	194.8	0.2	0.3	1,144.4	
1967	630.5	264.8	89.3	7.7	221.5	0.3	0.3	1,214.4	
1968	684.9	304.4	104.3	12.5	222.5	0.4	0.4	1,329.4	
1969	706.0	333.3	137.8	13.9	250.2	0.6	0.3	1,442.2	
1970	704.4	372.9	184.2	21.8	247.7	0.5	0.1	1,531.9	
1971	713.1	374.0	220.2	38.1	266.3	0.5	0.1	1,612.6	
1972	771.1	375.7	274.3	54.1	272.6	1.5	0.1	1,749.7	
1973	847.7	340.9	314.3	83.5	272.1	2.0	0.1	1,860.7	
1974	828.4	320.1	300.9	114.0	301.0	2.5	0.1	1,867.1	
1975	852.8	299.8	289.1	172.5	300.0	3.2	0.0	1,917.6	
1976	944.4	294.6	320.0	191.1	283.7	3.6	0.1	2,037.7	
1977	985.2	305.5	358.2	250.9	220.5	3.6	0.3	2,124.3	
1978	975.7	305.4	365.1	276.4	280.4	3.0	0.2	2,206.3	
1979	1,075.0	329.5	303.5	255.2	279.8	3.9	0.3	2,247.4	
1980	1,161.6	346.2	246.0	251.1	276.0	5.1	0.3	2,286.4	
1981	1,203.2	345.8	206.4	272.7	260.7	5.7	0.2	2,294.8	
1982	1,192.0	305.3	146.8	282.8	309.2	4.8	0.2	2,241.2	
1983	1,259.4	274.1	144.5	293.7	332.1	6.1	0.2	2,310.3	
1984	1,341.7	297.4	119.8	327.6	321.2	7.7	0.5	2,416.3	
1985	1,402.1	291.9	100.2	383.7	281.1	9.3	0.7	2,469.8	
1986	1,385.8	248.5	136.6	414.0	290.8	10.3	0.5	2,487.3	
1987	1,463.8	272.6	118.5	455.3	249.7	10.8	0.8	2,572.1	
1988	1,540.7	252.8	148.9	527.0	222.9	10.3	0.9	2,704.3	
1989	1,553.7	266.6	158.3	529.4	265.1	9.3	2.0	2,784.3	
1990	1,559.6	264.1	117.0	576.9	283.4	8.6	2.1	2,808.2	
1991	1,551.2	264.2	111.5	612.6	280.1	8.1	2.0	2,825.0	
1992	1,575.9	263.9	88.9	618.8	243.7	8.1	2.1	2,797.2	
1993	1,639.2	258.9	99.5	610.3	269.1	7.6	2.0	2,882.5	
1994	1,635.5	291.1	91.0	640.4	247.1	6.9	2.1	2,910.7	
1995	1,652.9	307.3	60.8	673.4	296.4	4.7	1.7	2,994.5	
1996	1,737.5	262.7	67.3	674.7	331.1	5.2	1.9	3,077.4	
1997	1,788.7	283.6	79.0	629.4	341.4	5.5	1.9	3,125.5	

**Source:** U.S. Department of Energy, Energy Information Administration, *Annual Energy Review* 1997, Table 8.3, p. 213, DOE/EIA-0384(97) (GPO, Washington, DC, 1998).

**Notes:** (s) = less than 0.0005 quadrillion Btu. Other renewable energy includes wood, waste, wind, and solar energy. Totals may not agree with sum of components due to independent rounding. Previous-year data may have been revised. Current-year data are preliminary and may be revised in future publications.

**Table 9.7 U.S. Nuclear Power Plant Operations, 1958-1997**

Year	Operable nuclear gener- ating units	Net gener- ation of electricity	Year	Operable nuclear gener- ating units	Net gener- ation of electricity
	number of units	billion kilowatt-hours		number of units	billion kilowatt-hours
1958	1	0.2	1978	70	276.4
1959	2	0.2	1979	69	255.2
1960	3	0.5	1980	71	251.1
1961	3	1.7	1981	75	272.7
1962	9	2.3	1982	78	282.8
1963	11	3.2	1983	81	293.7
1964	13	3.3	1984	87	327.6
1965	13	3.7	1985	96	383.7
1966	14	5.5	1986	101	414.0
1967	15	7.7	1987	107	455.3
1968	13	12.5	1988	109	527.0
1969	17	13.9	1989	111	529.4
1970	20	21.8	1990	112	576.9
1971	22	38.1	1991	111	612.6
1972	27	54.1	1992	109	618.8
1973	42	83.5	1993	110	610.3
1974	55	114.0	1994	109	640.4
1975	57	172.5	1995	109	673.4
1976	63	191.1	1996	109	674.7
1977	67	250.9	1997	107	629.4

**Source:** U.S. Department of Energy, Energy Information Administration, *Annual Energy Review* 1997, Table 9.1, p. 241 and Table 9.2, p. 243, DOE/EIA-0384(97) (GPO, Washington, DC, 1998).

**Notes:** Operable nuclear generating units are those facilities holding full-power licenses, or equivalent permission to operate at the end of the year. Previous-year data may have been revised. Current-year data are preliminary and may be revised in future publications.

**Table 9.8 U.S. Net Energy Imports by Source, 1960-1997**

Year	Coal	Natural gas (dry)	Petroleum	Other	Total
		quadrillion Btu			
1960	-1.02	0.15	3.57	0.04	2.74
1965	-1.37	0.44	5.01	- 0.02	4.06
1966	-1.35	0.47	5.21	- 0.01	4.32
1967	-1.35	0.50	4.91	- 0.02	4.04
1968	-1.37	0.58	5.73	- 0.02	4.90
1969	-1.53	0.70	6.42	- 0.02	5.56
1970	-1.93	0.77	6.92	- 0.04	5.72
1971	-1.54	0.88	8.07	(s)	7.41
1972	-1.53	0.97	9.83	0.05	9.32
1973	-1.42	0.98	12.98	0.14	12.68
1974	-1.57	0.91	12.66	0.19	12.19
1975	-1.74	0.90	12.51	0.08	11.75
1976	-1.57	0.92	15.20	0.09	14.65
1977	-1.40	0.98	18.24	0.20	18.02
1978	-1.00	0.94	17.06	0.33	17.32
1979	-1.70	1.24	16.93	0.27	16.75
1980	-2.39	0.96	13.50	0.18	12.25
1981	-2.92	0.86	11.38	0.33	9.65
1982	-2.77	0.90	9.05	0.28	7.46
1983	-2.01	0.89	9.08	0.36	8.31
1984	-2.12	0.79	9.89	0.40	8.96
1985	-2.39	0.90	8.95	0.41	7.87
1986	-2.19	0.69	11.53	0.36	10.38
1987	-2.05	0.94	12.53	0.49	11.91
1988	-2.45	1.22	14.01	0.37	13.15
1989	-2.57	1.28	15.33	0.14	14.18
1990	-2.70	1.46	15.29	0.03	14.08
1991	-2.77	1.67	14.22	0.25	13.37
1992	-2.59	1.94	14.96	0.33	14.64
1993	-1.78	2.25	16.40	0.32	17.19
1994	-1.69	2.52	17.26	0.50	18.58
1995	-2.14	2.74	16.87	0.42	17.90
1996	-2.19	2.85	18.21	0.39	19.26
1997	-2.00	2.88	19.12	0.39	20.39

**Source:** U.S. Department of Energy, Energy Information Administration, *Annual Energy Review* 1997, Table 1.4, p. 11, DOE/EIA-0384(97) (GPO, Washington, DC, 1998).

**Notes:** Net imports = imports minus exports. Other includes coal coke and small amounts of electricity transmitted across U.S. borders with Canada and Mexico. (s) = less than 0.0005 quadrillion Btu. Totals may not agree with sum of components due to independent rounding. Previous-year data may have been revised. Current-year data are preliminary and may be revised in future publications.

**Table 9.9 U.S. Energy Consumption by Sector, 1960-1997**

Year	Residential & commercial	Industrial	Transportation	Total
	..... quadrillion Btu .....			
1960	13.04	20.16	10.60	43.80
1961	13.44	20.25	10.77	44.46
1962	14.27	21.04	11.23	46.53
1963	14.71	21.95	11.66	48.32
1964	15.23	23.27	12.00	50.50
1965	16.03	24.22	12.43	52.68
1966	17.06	25.50	13.10	55.66
1967	18.10	25.72	13.75	57.57
1968	19.23	26.90	14.86	61.00
1969	20.59	28.10	15.50	64.19
1970	21.71	28.63	16.09	66.43
1971	22.59	28.57	16.72	67.89
1972	23.69	29.86	17.71	71.26
1973	24.14	31.53	18.60	74.28
1974	23.72	30.70	18.12	72.54
1975	23.90	28.40	18.25	70.55
1976	25.02	30.24	19.10	74.36
1977	25.39	31.08	19.82	76.29
1978	26.09	31.39	20.61	78.09
1979	25.81	32.61	20.47	78.90
1980	26.65	30.61	19.69	75.96
1981	25.24	29.24	19.51	73.99
1982	25.63	26.14	19.07	70.85
1983	25.63	25.75	19.13	70.52
1984	26.48	27.86	19.80	74.14
1985	26.70	27.22	20.07	73.98
1986	26.85	26.63	20.81	74.30
1987	27.62	27.83	21.45	76.89
1988	28.92	28.99	22.30	80.22
1989	29.42	29.36	22.56	81.35
1990	29.45	32.12	22.54	84.12
1991	30.12	31.78	22.12	84.03
1993	30.05	33.03	22.46	85.55
1993	31.17	33.31	23.88	87.37
1994	31.42	34.26	23.57	89.25
1995	32.30	34.48	24.07	90.86
1996	33.69	35.51	24.66	93.87
1997	33.72	35.67	24.81	94.21

**Source:** U.S. Department of Energy, Energy Information Administration, *Annual Energy Review* 1997, Table 2.1, p. 37, DOE/EIA-0384(97) (GPO, Washington, DC, 1998).

**Notes:** Energy sources include coal, natural gas, petroleum, electricity, and electrical system energy losses. Beginning in 1990, sources also include renewable energy. Industrial also includes hydroelectric power and net imports of coal coke. Totals may not agree with sum of components due to independent rounding. Previous-year data may have been revised. Current-year data are preliminary and may be revised in future publications.

**Table 9.10 U.S. Energy Consumption per Capita and per Dollar of Gross Domestic Product, 1960-1997**

Year	Total energy consumption quadrillion Btu	Population million people	Energy consumption per capita million Btu	Gross Domestic Product (GDP) billion chained (1992) dollar	Energy consumption per dollar of GDP thous Btu per chained (1992) \$
1960	43.80	179.3	244	2,262.9	19.36
1961	44.46	183.0	243	2,314.3	19.21
1962	46.53	185.8	250	2,454.8	18.96
1963	48.32	188.5	256	2,559.4	18.88
1964	50.50	191.1	264	2,708.4	18.64
1965	52.68	193.5	272	2,881.1	18.29
1966	55.66	195.6	285	3,069.2	18.13
1967	57.57	197.5	292	3,147.2	18.29
1968	61.00	199.4	306	3,293.9	18.52
1969	64.19	201.4	319	3,393.6	18.92
1970	66.43	203.2	327	3,397.6	19.55
1971	67.89	206.8	328	3,510.0	19.34
1972	71.26	209.3	340	3,702.3	19.25
1973	74.28	211.4	351	3,916.3	18.97
1974	72.54	213.3	340	3,891.2	18.64
1975	70.55	215.5	327	3,873.9	18.21
1976	74.36	217.6	342	4,082.9	18.21
1977	76.29	219.8	347	4,273.6	17.85
1978	78.09	222.1	352	4,503.0	17.34
1979	78.90	224.6	351	4,630.6	17.04
1980	75.96	226.5	335	4,615.0	16.46
1981	73.99	229.6	322	4,720.7	15.67
1982	70.85	232.0	305	4,620.3	15.33
1983	70.52	234.3	301	4,803.7	14.68
1984	74.14	236.5	314	5,140.1	14.42
1985	73.98	238.7	310	5,323.5	13.90
1986	74.30	241.1	308	5,487.7	13.54
1987	76.89	243.4	316	5,649.5	13.61
1988	80.22	245.8	326	5,865.2	13.68
1989	81.35	248.2	328	6,062.0	13.42
1990	84.12	248.8	338	6,136.3	13.71
1991	84.03	252.1	333	6,079.4	13.82
1992	85.55	255.0	336	6,244.4	13.70
1993	87.37	257.8	339	6,389.6	13.67
1994	89.25	260.3	343	6,610.7	13.50
1995	90.86	262.8	346	6,742.1	13.48
1996	93.87	265.2	354	6,928.4	13.55
1997	94.21	267.6	352	7,189.6	13.10

**Source:** U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 1997*, Table 1.5, p. 13, DOE/EIA-0384(97) (GPO, Washington, DC, 1998).

**Notes:** Previous-year data may have been revised. Current-year data are preliminary and may be revised in future publications.

**Table 9.11 U.S. Renewable Energy Production by Source, 1960-1997**

Year	Conven-tional hydroelectric power	Geo-thermal energy	Biofuels	Solar energy	Wind energy	Total renewable energy	Percentage of total U.S. energy production
..... quadrillion Btu .....						%	
1960	1.608	0.001	0.002	0	0	1.610	3.88
1961	1.656	0.002	0.001	0	0	1.660	3.95
1962	1.816	0.002	0.001	0	0	1.820	4.18
1963	1.771	0.004	0.001	0	0	1.776	3.87
1964	1.886	0.005	0.002	0	0	1.892	3.96
1965	2.059	0.004	0.003	0	0	2.066	4.19
1966	2.062	0.004	0.003	0	0	2.069	3.97
1967	2.347	0.007	0.003	0	0	2.357	4.28
1968	2.349	0.009	0.004	0	0	2.362	4.16
1969	2.648	0.013	0.003	0	0	2.665	4.51
1970	2.634	0.011	0.004	0	0	2.649	4.27
1971	2.824	0.012	0.003	0	0	2.839	4.63
1972	2.864	0.031	0.003	0	0	2.899	4.64
1973	2.861	0.043	0.003	0	0	2.907	4.68
1974	3.177	0.053	0.003	0	0	3.232	5.31
1975	3.155	0.070	0.002	0	0	3.227	5.39
1976	2.976	0.078	0.003	0	0	3.057	5.10
1977	2.333	0.077	0.005	0	0	2.416	4.01
1978	2.937	0.064	0.003	0	0	3.005	4.92
1979	2.931	0.084	0.005	0	0	3.020	4.73
1980	2.900	0.110	0.005	0	0	3.014	4.65
1981	2.758	0.123	0.004	0	0	2.885	4.48
1982	3.266	0.105	0.003	0	0	3.374	5.28
1983	3.527	0.129	0.004	0	(s)	3.661	5.97
1984	3.386	0.165	0.009	0	(s)	3.560	5.40
1985	2.970	0.198	0.014	0	(s)	3.183	4.91
1986	3.071	0.219	0.012	0	(s)	3.303	5.13
1987	2.635	0.229	0.015	0	(s)	2.879	4.43
1988	2.334	0.217	0.017	0	(s)	2.569	3.89
1989	2.798	0.197	0.020	(s)	(s)	3.015	4.56
1990	3.032	0.344	2.632	0.063	0.023	6.094	8.61
1991	3.005	0.349	2.642	0.066	0.027	6.089	8.64
1992	2.618	0.361	2.788	0.068	0.030	5.864	8.38
1993	2.893	0.375	2.784	0.071	0.031	6.154	9.01
1994	2.683	0.370	2.838	0.072	0.036	5.999	8.48
1995	3.206	0.321	2.846	0.073	0.033	6.479	9.12
1996	3.594	0.339	2.938	0.075	0.035	6.981	9.65
1997	3.723	0.366	2.723	0.075	0.039	6.925	9.57

**Source:** U.S. Department of Energy, Energy Information Administration, *Annual Energy Review* 1997, Table 1.2, p. 7, DOE/EIA-0035(97) (GPO, Washington, DC, 1998).

**Notes:** (s) = less than 0.0005 quadrillion Btu. Current-year data are preliminary and may be revised in future publications. This table provides detail on renewable energy production summarized in Part III, Table 9.2. See Part III, Table 9.12 for definitions of different renewable energy sources.

**Table 9.12 U.S. Renewable Energy Consumption by Sector, 1990-1997**

Year	Residential and commercial	Industrial	Trans- portation	Electric utility	Total
	quadrillion Btu				
1990	0.645	2.217	0.082	3.252	6.197
1991	0.680	2.234	0.065	3.326	6.304
1992	0.714	2.360	0.079	2.975	6.128
1993	0.664	2.449	0.088	3.225	6.426
1994	0.656	2.533	0.097	3.023	6.309
1995	0.717	2.487	0.104	3.454	6.763
1996	0.722	2.633	0.074	3.886	7.315
1997	0.553	2.612	0.097	3.883	7.145

**Source:** U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 1997*, Table 10.2, p. 251, DOE/EIA-0384(97) (GPO, Washington, DC, 1998).

**Notes:** Previous-year data may have been revised. Current-year data are preliminary and may be revised in future publications. Renewable energy refers to energy derived from the following sources: conventional hydroelectric power, geothermal power, biofuels, solar energy, and wind energy. Hydroelectricity generated by pumped storage is not included in renewable energy estimates. Conventional hydroelectric power includes electricity net imports from Canada that are derived from hydroelectric energy. Geothermal power includes electricity imports from Mexico that are derived from geothermal energy. Geothermal includes only grid-connected electricity; excludes shaft power and remote electrical power. Biofuels are wood, wood waste, peat, wood sludge, municipal solid waste, agricultural waste, straw, tires, landfill gases, fish oil, and/or other waste, and ethanol blended into motor gasoline. Solar energy includes photovoltaic energy. Wind energy includes only grid-connected electricity; excludes direct heat applications. Previous-year data may have been revised. Current-year data are preliminary and may be revised in future publications.

**Table 9.13 Estimates of U.S. Energy Intensity by Sector, Selected Years, 1977-1996**

Year	Residential <i>million Btu per household</i>	Commercial <i>thousand Btu per sq. ft.</i>	Manufacturing <i>thous. Btu per 1987 \$ value of shipments</i>	Transportation	
				Passenger automobiles <i>thous. Btu per vehicle- mile</i>	Freight trucks <i>thous. Btu per vehicle- mile</i>
1977	na	na	6.0	8.96	23.87
1978	138	na	5.8	8.84	24.01
1979	126	115.0	5.7	8.65	24.26
1980	114	na	5.5	7.92	24.43
1981	114	na	5.4	7.67	24.89
1982	103	na	4.9	7.49	24.30
1983	na	98.2	4.7	7.38	23.74
1984	105	na	4.5	7.22	23.36
1985	na	na	4.4	7.18	23.02
1986	na	86.6	4.2	7.21	22.92
1987	101	na	4.2	6.98	22.39
1988	na	na	4.3	6.70	22.59
1989	na	91.6	4.3	6.60	22.39
1990	98	na	4.3	6.18	22.77
1991	na	na	4.4	5.93	22.71
1992	na	80.9	na	5.97	22.56
1993	104	na	na	6.10	22.31
1994	na	na	5.0	6.04	22.16
1995	na	90.5	na	5.92	22.17
1996	na	na	na	5.87	21.96

**Sources:** Davis, T.C., *Transportation Energy Databook: Edition 18*, Table 2.14, p. 2-16, and Table 2.15, p. 2-17, ORNL-6941 (U.S. Department of Energy, Oak Ridge National Laboratory, Oak Ridge, TN, 1998).

U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 1995*, Table 2.4, p. 45, DOE/EIA-0384(95) (GPO, Washington, DC, 1996).

--, *Annual Energy Review 1997* Table 2.4, p. 43 and Table 2.11, p. 57, DOE/EIA-0384(97) (GPO, Washington, DC, 1998).

--, 1994 MECS Tables and Spreadsheets (Internet accessible data files; release date May 14, 1998) (DOE, EIA, Washington, DC, 1998).

**Notes:** na = not available. Residential energy intensity data are derived from the Residential Energy Consumption Survey which was first conducted in 1978 and then triennially since 1984. (Residential energy consumption data for 1997 were not available at the time of this printing.) Commercial energy intensity data are from the Commercial Buildings Energy Consumption Survey, first conducted in 1979 and then triennially since 1983. Manufacturing energy intensity data are derived from the triennial Manufacturing Energy Consumption Survey (MECS). The next MECS will be conducted for the reporting year 1998, with subsequent MECS's being conducted every 4 years thereafter. Transportation energy intensity data are reported annually. Freight trucks refers to heavy single-unit and combination trucks.

# Transportation

**Table 10.1 U.S. Passenger-Miles of Travel, Five-Year Intervals, 1960-1990, and Annually, 1991-1996**

Year	Highway	Transit	Rail	Air	Total
..... billion passenger-miles .....					
1960	1,418.00	4.20	17.10	33.40	1,473.00
1965	1,678.00	4.10	13.30	57.60	1,753.00
1970	2,092.00	4.60	6.20	117.50	2,220.00
1975	2,362.00	4.50	3.90	147.40	2,518.00
1980	2,562.00	39.90	4.50	219.00	2,803.00
1985	2,845.90	39.60	4.80	290.10	3,158.00
1990	3,305.00	41.10	6.00	358.90	3,689.00
1991	3,631.00	40.70	6.30	350.30	4,007.00
1992	3,746.00	40.30	6.10	365.50	4,137.00
1993	3,825.00	39.40	6.20	372.30	4,223.00
1994	3,918.00	39.60	5.90	398.80	4,343.00
1995	3,868.00	39.80	5.50	414.40	4,308.00
1996	3,962.00	41.30	5.10	445.20	4,412.00

**Source:** U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 1998*, Table 1-10 (DOT, BTS, Washington, DC, 1998).

**Notes:** BTS has rounded the categories on this table as follows: to the nearest billion passenger-miles; Passenger-Miles, total; Highway; to the nearest 100 million passenger-miles: Air; Transit; and Rail. Highway includes passenger car and taxi, motorcycle, other 2-axle 4-tire vehicle, single unit 2-axle 6-tire or more truck, combination truck, intercity bus, and school bus. Highway passenger-miles are calculated by multiplying vehicle-miles of travel as cited by the U.S. Department of Transportation, Federal Highway Administration by the number of occupants for each vehicle type (as estimated by the U.S. Department of Transportation, Federal Highway Administration using the Nationwide Personal Transportation Survey). Transit includes motor bus, light rail, heavy rail, trolley bus, commuter rail, demand response, ferry boat, and other. Transit passenger-miles are the cumulative sum of the distance ridden by each passenger. Rail includes intercity/Amtrak, which began operations in 1971. Rail passenger-miles represent the movement of one passenger for one mile. Does not include contract commuter passengers. Air includes air carrier, certified domestic service and general aviation. Air carrier passenger-miles are computed by the summation of the products of the aircraft miles flown on each inter-airport hop multiplied by the number of passengers carried on that hop.

## Transportation

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**Table 10.2 U.S. Ton-Miles of Freight, Five-Year Intervals, 1960-1990, and Annually, 1991-1996**

Year	Intercity truck	Class I rail	Domestic air carrier	Domestic water	Oil pipeline
<i>billion ton-miles</i>					
1960	285.00	572.31	0.55	413.33	229.00
1965	359.00	697.88	1.35	489.80	306.40
1970	412.00	764.81	2.19	596.20	431.00
1975	454.00	754.25	3.47	565.98	507.00
1980	555.00	918.96	4.53	921.84	588.20
1985	610.00	876.98	5.16	892.97	564.30
1990	735.00	1,033.97	9.06	833.54	584.10
1991	758.00	1,038.88	8.86	848.40	578.50
1992	815.00	1,066.78	9.82	856.69	588.80
1993	861.00	1,109.31	10.68	789.66	592.90
1994	908.00	1,200.70	11.80	814.92	591.40
1995	921.00	1,305.69	12.52	807.73	601.10
1996	986.00	1,355.98	12.86	764.69	619.20

**Source:** U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 1998*, Table 1-11 (DOT, BTS, Washington, DC, 1998).

**Notes:** Air includes revenue ton-miles of freight, U.S. and foreign mail, and express. Rail includes revenue ton-miles. Domestic water excludes intraterritorial traffic, for which ton-miles were not compiled. Domestic water data for 1980 reflect start up between 1975 and 1980 of Alaska pipeline and subsequent water transport of crude petroleum from Alaskan ports to mainland U.S. for refining.

**Table 10.3 Average Annual U.S. Vehicle-Miles of Travel and Average Miles Traveled per Gallon of Fuel Consumed by Vehicle Type, 1960-1997**

Year	Passenger cars <sup>1</sup>		Buses <sup>2</sup>		Other 2-axle, 4-tire vehicles <sup>3</sup>		Single-unit trucks <sup>4</sup>		Trailer combination trucks	
	1,000 vmt	vmt/gallon	1,000 vmt	vmt/gallon	1,000 vvmt	vmt/gallon	1,000 vmt	vmt/gallon	1,000 vmt	vmt/gallon
1960	9.52	14.3	15.97	5.3	na	na	na	na	na	na
1961	9.52	14.4	15.71	5.3	na	na	na	na	na	na
1962	9.49	14.3	15.67	5.3	na	na	na	na	na	na
1963	9.59	14.6	15.06	5.4	na	na	8.60	8.8	42.63	4.9
1964	9.67	14.6	15.12	5.3	na	na	8.68	8.7	41.48	4.9
1965	9.60	14.5	14.90	5.3	na	na	9.20	9.3	40.26	4.8
1966	9.73	14.1	14.06	5.4	8.08	9.7	6.55	6.2	39.00	5.2
1967	9.85	14.1	13.69	5.4	7.88	9.8	6.63	6.3	40.25	5.2
1968	9.92	13.9	14.00	5.4	8.38	9.9	6.56	6.5	39.64	5.0
1969	9.92	13.6	13.23	5.4	8.36	9.8	7.34	6.7	38.70	4.8
1970	9.99	13.5	12.04	5.5	8.68	10.0	7.36	6.8	38.82	4.8
1971	10.10	13.6	12.09	5.7	9.08	10.2	7.69	6.9	40.49	4.9
1972	10.17	13.5	13.14	5.8	9.53	10.3	8.02	6.5	42.34	5.0
1973	9.88	13.4	13.63	5.9	9.78	10.5	8.15	6.4	44.37	5.1
1974	9.22	13.6	12.72	5.9	9.45	11.0	7.94	6.4	42.37	5.1
1975	9.31	14.0	13.10	5.8	9.83	10.5	8.18	6.4	41.32	5.1
1976	9.42	13.8	13.08	6.0	10.13	10.8	8.37	6.4	40.56	5.1
1977	9.52	14.1	11.87	6.0	10.61	11.2	8.84	6.3	44.92	5.1
1978	9.50	14.3	11.65	5.9	10.97	11.6	9.46	6.1	46.95	5.2
1979	9.06	14.6	11.29	6.0	10.80	11.9	9.33	6.0	48.32	5.2
1980	8.81	16.0	11.46	6.0	10.44	12.2	9.10	5.8	48.47	5.3
1981	8.87	16.5	11.48	5.9	10.24	12.5	8.88	5.8	54.82	5.1
1982	9.05	16.9	10.41	5.9	10.28	13.5	9.40	6.0	55.93	5.2
1983	9.12	17.1	8.92	5.9	10.50	13.7	10.12	6.1	56.43	5.3
1984	9.25	17.4	7.95	5.7	11.15	14.0	10.94	6.1	57.74	5.5
1985	9.42	17.5	7.55	5.4	10.51	14.3	9.89	6.1	55.63	5.6
1986	9.46	17.4	7.94	5.3	10.76	14.6	10.58	6.2	57.56	5.6
1987	9.72	18.0	8.85	5.8	11.11	14.9	11.47	6.4	55.89	5.7
1988	9.97	18.8	8.89	5.8	11.47	15.4	11.06	6.4	53.11	5.8
1989	10.16	19.0	9.07	6.0	11.68	16.1	11.26	6.5	53.82	5.8
1990	10.28	20.3	9.13	6.4	11.90	16.1	11.57	6.2	55.21	5.8
1991	10.32	21.2	9.11	6.7	12.25	17.0	11.81	6.5	57.14	5.7
1992	10.57	21.0	8.96	6.6	12.38	17.3	12.33	6.5	59.40	5.8
1993	10.55	20.6	9.36	6.6	12.43	17.4	12.88	6.7	61.37	5.8
1994	10.76	20.8	9.56	6.6	12.16	17.3	12.49	6.8	64.78	5.8
1995	11.20	21.1	9.37	6.6	12.02	17.3	12.48	6.8	68.08	5.8
1996	11.33	21.2	9.45	6.6	11.81	17.2	12.17	6.8	68.08	5.9
1997	11.58	21.5	9.80	6.7	12.11	17.2	12.63	7.0	69.55	6.1

**Sources:** U.S. Department of Transportation, Federal Highway Administration, Office of Highway Information Management, *Highway Statistics 1997*, Table VM-1 (GPO, Washington, DC, 1998) and earlier reports in this series.

**Notes:** <sup>1</sup>Includes motorcycles. <sup>2</sup>Includes commercial, school, and non-revenue buses. <sup>3</sup>Includes vans, pickup trucks, and sport/utility vehicles which are considered passenger vehicles. Prior to 1966, these vehicles were included in the single-unit truck category. <sup>4</sup>Includes 2-axle, 6-tire or more trucks on a single frame.

## Transportation

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**Table 10.4 U.S. Personal Travel per Household, Driver, and Mode, 1969, 1977, 1983, 1990, and 1995**

Characteristics of personal travel	Unit	Year				
		1969	1977	1983	1990	1995
Persons per household	no.	3.16	2.83	2.69	2.56	2.44
Licensed drivers per household	no.	1.65	1.69	1.72	1.75	1.79
Vehicles per household	no.	1.16	1.59	1.68	1.77	1.78
Daily vehicle trips per household	no.	3.83	3.95	4.07	4.66	6.35
Daily vehicle miles per household	mi.	34.01	32.97	32.16	41.37	57.25
Average vehicle occupancy rate	per./veh.	na	1.90	1.70	1.60	1.59
Home to work	per./veh.	na	1.30	1.30	1.10	1.14
Family & personal business	per./veh.	na	2.00	1.80	1.80	1.82
Shopping	per./veh.	na	2.10	1.80	1.70	1.79
Social & recreation	per./veh.	na	2.40	2.10	2.10	2.17
Average vehicle trip length	mi.	8.90	8.40	7.90	9.00	9.10
Home to work	mi.	9.40	9.10	8.50	10.60	11.60
Family & personal business	mi.	6.50	6.80	6.70	7.40	na
Shopping	mi.	4.40	5.00	5.30	5.10	na
Social & recreation	mi.	13.10	10.30	10.50	11.80	na
Vacation	mi.	160.00	77.90	113.90	114.90	na
Average distance to work	mi.	9.40	9.20	8.50	10.60	11.60
by automobile	mi.	9.40	9.10	9.90	10.40	na
by truck	mi.	14.20	10.60	11.40	13.00	na
by bus	mi.	8.70	7.20	8.60	9.30	na
Average annual travel per driver	1,000 mi.	8.69	9.92	10.29	13.13	na
by male drivers	1,000 mi.	11.35	13.40	13.96	16.64	na
by female drivers	1,000 mi.	5.41	5.94	6.38	9.53	na
Average annual personal travel*	1,000 mi.	7.66	9.47	9.14	10.42	na
by private vehicle	1,000 mi.	na	8.15	7.52	9.18	na
by public vehicle	1,000 mi.	na	0.25	0.24	0.24	na
by other mode	1,000 mi.	na	1.06	1.37	0.97	na

**Sources:** U.S. Department of Transportation, Federal Highway Administration, 1990 *NPTS Databook: Nationwide Personal Transportation Study*, Vol. I (DOT, FHWA, Washington, DC, 1993).

--, 1990 *NPTS Databook: Nationwide Personal Transportation Study*, Vol. II (DOT, FHWA, Washington, DC, 1995).

--, *Our Nation's Travel: 1995 NPTS Early Results Report, Technical Appendix* (DOT, FHWA, Washington, DC, 1997).

**Notes:** \*per person. Household vehicles include automobiles, station wagons, and vanbuses/minibuses, and, except for 1969, light pickups and other light trucks. Household vehicles are those that are owned, leased, rented, or company owned and left at home to be regularly used by household members. They also include vehicles used solely for business purposes or business-owned vehicles if left at home and used for the home-to-work trip (e.g., taxicabs and police cars). Average vehicle trip length for 1969 is for automobiles only. Family and personal business includes vehicle trips to shop, pickup or deposit passengers, shoe repair, haircuts, etc. Social/recreation includes vehicle trips to visit relatives and friends, go to a movie or play, attend or participate in a sporting event, etc. Private vehicle modes of travel include automobile, van, pick-up truck, and motorcycle. Public transportation includes bus, commuter rail, subway, elevated rail, streetcar, and trolley. Other includes airplane, Amtrak, taxi, school bus, moped, bicycle, and, except for 1969, walking.

**Table 10.5 Journey-To-Work Mode for U.S. Working Population, 1960-1990**

Mode of transportation	Year			
	1960	1970	1980	1990
..... <i>U.S. working population, in millions</i> .....				
Private vehicle	42.99	61.96	83.02	101.29
Public transit	7.81	6.51	6.01	5.89
Walked to work	6.42	5.69	5.41	4.49
Worked at home	4.66	2.69	2.18	3.41
Total	61.87	76.85	96.62	115.07
..... <i>percent of U.S. working population</i> .....				
Private vehicle	69.48	80.63	85.92	88.02
Public transit	12.62	8.48	6.22	5.12
Walked to work	10.37	7.40	5.60	3.90
Worked at home	7.54	3.49	2.26	2.96

**Source:** U.S. Department of Commerce, Bureau of the Census, *Census of Population and Housing* for 1960, 1970, 1980, and 1990 (GPO, Washington, DC, decennial).

**Table 10.6 Congestion on U.S. Urban Interstate Highways, Selected Years, 1975-1997**

Year	Peak-hour travel time under congested conditions	Peak-hour miles traveled under congested conditions	Average daily vehicles per lane
..... percent with V/SF > or = 0.80 .....			
1975	41	23	na
1978	48	29	na
1980	52	28	na
1982	53	28	na
1984	55	30	9.99
1985	61	36	10.33
1986	63	37	10.79
1987	64	38	11.21
1988	67	42	11.68
1989	69	44	11.99
1990	69	45	12.26
1991	70	47	12.42
1992	70	46	12.38
1993	53	32	12.58
1994	68	45	12.81
1995	55	34	13.11
1996	54	33	13.38
1997	55	35	14.16

**Source:** U.S. Department of Transportation (DOT), Federal Highway Administration (FHWA), *Highway Statistics 1997*, Chart "Urban Interstate System Congestion Trends," p. V-68 (DOT, FHWA, Washington, DC, 1998).

**Notes:** The FHWA uses several procedures to measure congestion on urban interstate highways: the Volume/Service Flow (V/SF) Ratio; Volume per Lane (average daily travel/lane); and hours of delay/1,000 Vehicle Miles of Travel. Data derived from the first two procedures are presented in this table. The V/SF is a computed numerical value based upon traffic volume information and roadway capacity. As this ratio gets larger, traffic slows and eventually stops as the theoretical value of 1.00 (the volume of traffic = service flow capacity of the facility) is approached. A V/SF ratio value of greater than or equal to 0.80 is used to indicate congestion. Methods used to calculate V/SF have been revised based on research that showed that drivers are willing to follow each other more closely and at higher speeds than previously. Although this change in driving habits occurred over a period of years, the change in procedure occurred abruptly, starting with data for 1993. Thus congestion data for 1993 forward are not strictly comparable to data for previous years. The second measure is calculated from actual counts of average daily travel and the number of lanes per segment of interstate highway. States are required to report annual average daily travel (AADT) for all interstate and principal arterials on a 3-year cycle. AADT is updated annually.

# Global Environment

**Table 11.1 World Population, Energy Consumption, and Energy-Related Carbon Dioxide Emissions by Region, 1986-1995**

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
North America										
Population	346	350	354	358	363	369	374	379	383	388
Energy consumption	89	92	96	98	98	98	99	101	103	106
CO <sub>2</sub> emissions	1,385	1,436	1,515	1,541	1,474	1,494	1,527	1,527	1,663	1,694
Cen. & So. America										
Population	327	333	339	346	352	358	364	370	376	383
Energy consumption	13	13	14	14	14	15	15	16	17	17
CO <sub>2</sub> emissions	163	175	178	179	177	186	194	204	224	234
Western Europe										
Population	446	448	451	454	457	460	463	466	468	471
Energy consumption	61	62	63	64	64	65	64	64	64	66
CO <sub>2</sub> emissions	909	912	883	912	920	900	885	872	859	890
Eastern Europe										
Population	379	382	383	385	390	392	392	392	392	393
Energy consumption	70	72	74	73	71	67	63	59	53	51
CO <sub>2</sub> emissions	1,298	1,347	1,368	1,335	1,223	1,173	1,060	1,009	880	934
Middle East										
Population	116	119	123	126	130	134	137	141	145	149
Energy consumption <sup>9</sup>	10	10	11	11	11	12	13	13	14	14
CO <sub>2</sub> emissions	147	146	157	163	167	312	200	208	235	243
Africa										
Population	574	591	608	624	641	661	682	703	724	746
Energy consumption	10	10	10	10	10	11	11	11	12	12
CO <sub>2</sub> emissions	169	168	178	180	182	186	194	195	198	196
Far East & Oceania										
Population	2,740	2,785	2,836	2,887	2,934	2,982	3,030	3,078	3,145	3,195
Energy consumption	61	64	69	72	74	77	80	86	91	96
CO <sub>2</sub> emissions	1,199	1,256	1,356	1,383	1,449	1,534	1,611	1,659	1,785	1,875
WORLD										
Population	4,927	5,009	5,094	5,180	5,266	5,356	5,442	5,528	5,634	5,724
Energy consumption	313	323	335	341	343	343	345	351	354	362
CO <sub>2</sub> emissions	5,270	5,440	5,635	5,693	5,593	5,785	5,671	5,674	5,844	6,066

**Sources:** U.S. Department of Energy, Energy Information Administration, *International Energy Annual 1995*, Appendix Table E1, pp. 169-170, and Appendix Table B1, pp.121-124, DOE/EIA-0219(95) (GPO, Washington, DC, 1996).

Marland, G. and T. Boden, Oak Ridge National Laboratory, *Global CO<sub>2</sub> Emissions From Fossil-Fuel Burning, Cement Production, and Gas Flaring :1751-1996* (an Internet accessible numerical database) (Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, Oak Ridge, TN, 1999).

**Notes:** Population is expressed in millions, energy consumption in quadrillion Btu, and CO<sub>2</sub> emissions in million metric tons of carbon (to convert the latter to carbon dioxide gas emitted, multiply times 3.664). Energy-related carbon dioxide emissions refers to emissions from fossil fuel burning and gas flaring; excludes emissions from cement production. Regional grouping of countries in sources have been reconciled as follows: North America includes Mexico; Western Europe includes Germany and Turkey; Eastern Europe includes the former USSR, and Far East and Oceania includes Centrally Planned Asia.

**Table 11.2 Global Emissions of Carbon Dioxide From Fossil-Fuel Burning, Cement Manufacture, and Gas Flaring, Five-Year Intervals, 1950-1960, and Annually, 1961-1996**

Year	Fossil-fuel burning			Cement manufacture	Gas flaring	Total	Per capita tons of carbon
	Solids	Liquids	Gas				
	million metric tons of carbon						
1950	1,070	423	97	18	23	1,630	0.65
1955	1,208	625	150	30	31	2,043	0.74
1960	1,411	850	235	43	39	2,578	0.85
1961	1,349	905	254	45	42	2,595	0.84
1962	1,351	981	277	49	44	2,701	0.86
1963	1,397	1,053	300	51	47	2,849	0.89
1964	1,435	1,138	328	57	51	3,009	0.92
1965	1,461	1,221	351	59	55	3,146	0.94
1966	1,478	1,325	380	63	60	3,306	0.97
1967	1,448	1,424	410	65	66	3,413	0.98
1968	1,448	1,552	445	70	73	3,589	1.01
1969	1,487	1,674	487	74	80	3,802	1.05
1970	1,556	1,838	516	78	87	4,076	1.10
1971	1,556	1,946	554	84	88	4,227	1.12
1972	1,572	2,055	583	89	94	4,395	1.14
1973	1,580	2,240	608	95	110	4,633	1.18
1974	1,577	2,244	618	96	107	4,641	1.16
1975	1,671	2,131	623	95	93	4,613	1.13
1976	1,708	2,313	647	103	109	4,880	1.17
1977	1,770	2,389	646	108	104	5,018	1.19
1978	1,786	2,383	674	116	107	5,066	1.18
1979	1,882	2,534	714	119	100	5,348	1.22
1980	1,936	2,406	725	120	89	5,276	1.19
1981	1,908	2,270	735	121	72	5,105	1.13
1982	1,970	2,178	730	121	69	5,068	1.10
1983	1,976	2,162	732	125	63	5,058	1.08
1984	2,067	2,183	790	128	58	5,226	1.10
1985	2,223	2,171	821	131	57	5,402	1.11
1986	2,284	2,276	840	137	54	5,590	1.13
1987	2,334	2,287	902	143	51	5,718	1.14
1988	2,398	2,390	949	152	53	5,941	1.16
1989	2,432	2,427	983	156	50	6,048	1.16
1990	2,373	2,495	1,019	157	60	6,103	1.15
1991	2,307	2,608	1,036	161	71	6,182	1.15
1992	2,336	2,505	1,024	167	63	6,095	1.12
1993	2,276	2,502	1,056	176	63	6,072	1.10
1994	2,343	2,544	1,082	187	65	6,221	1.10
1995	2,422	2,568	1,154	196	67	6,408	1.13
1996	2,460	2,592	1,196	202	67	6,518	1.13

**Source:** Marland, G., T. A. Boden, R.J. Andres, A.L. Brenkert, and C.A. Johnston, *Global CO<sub>2</sub> Emissions From Fossil-Fuel Burning, Cement Manufacture, and Gas Flaring: 1751-1996* (an Internet accessible numerical database) (Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, Oak Ridge, TN, 1999).

**Table 11.3 Global Production and Atmospheric Release of Chlorofluorocarbons, 1960-1996**

Year	CFC-11		CFC-11			CFC-12		CFC-12		
	Annual		Prod	Rel	Unrel	Annual		Prod	Rel	Unrel
	Prod	Rel				Prod	Rel			
million kilograms										
1960	50	41	287	252	39	99	89	828	695	155
1961	61	52	347	305	48	109	100	937	794	166
1962	78	65	425	370	62	128	115	1,065	909	183
1963	93	80	519	450	77	146	134	1,211	1,043	199
1964	111	95	630	545	94	170	156	1,381	1,198	218
1965	123	108	753	653	111	190	175	1,571	1,374	237
1966	141	121	894	775	133	216	195	1,788	1,569	264
1967	160	138	1,053	912	157	243	220	2,030	1,788	293
1968	183	157	1,237	1,069	186	268	247	2,298	2,035	320
1969	217	182	1,454	1,251	225	297	274	2,595	2,309	351
1970	238	207	1,692	1,457	260	321	300	2,916	2,609	380
1971	263	227	1,955	1,684	300	342	322	3,258	2,931	408
1972	307	256	2,262	1,940	356	380	350	3,638	3,281	448
1973	349	292	2,611	2,233	418	423	387	4,061	3,668	495
1974	370	321	2,981	2,554	472	443	419	4,504	4,087	530
1975	314	311	3,295	2,865	479	381	404	4,885	4,491	516
1976	340	317	3,635	3,182	508	411	390	5,296	4,881	547
1977	321	304	3,955	3,486	529	383	371	5,678	5,252	568
1978	309	284	4,264	3,769	559	372	341	6,050	5,594	608
1979	290	264	4,554	4,033	589	357	338	6,408	5,931	637
1980	290	251	4,843	4,284	632	350	333	6,758	6,264	663
1981	287	248	5,130	4,532	675	351	341	7,109	6,604	683
1982	271	240	5,402	4,771	711	328	337	7,437	6,942	681
1983	292	253	5,693	5,024	755	355	343	7,793	7,285	702
1984	312	271	6,006	5,295	801	382	359	8,175	7,645	735
1985	327	281	6,332	5,576	851	376	368	8,551	8,013	752
1986	350	295	6,683	5,871	912	398	377	8,949	8,389	784
1987	382	311	7,065	6,182	989	425	387	9,374	8,776	833
1988	376	315	7,441	6,496	1,056	421	393	9,795	9,169	871
1989	303	265	7,743	6,761	1,098	380	365	10,175	9,533	896
1990	233	216	7,976	6,978	1,118	231	311	10,406	9,844	822
1991	214	188	8,190	7,166	1,147	225	272	10,631	10,116	781
1992	186	171	8,376	7,337	1,165	216	255	10,847	10,371	747
1993	147	158	8,523	7,495	1,156	215	328	11,062	10,609	729
1994	60	137	8,583	7,632	1,080	134	212	11,195	10,820	655
1995	33	124	8,616	7,756	989	83	189	11,278	11,009	551
1996	22	118	8,638	7,874	893	49	166	11,327	11,175	435

**Source:** Alternative Fluorocarbons Environmental Acceptability Study, *Production, Sales and Atmospheric Release of Fluorocarbons Through 1996* (an Internet accessible dataset).

**Notes:** Prod = Produced. Rel = Released. Unrel = Unreleased. Data are rounded to the nearest million kilograms. Production data are voluntarily reported by the chemical industry through a survey conducted by an independent accountant, Grant Thornton LLP. The companies surveyed have production in the following countries: Argentina, Australia, Brazil, Canada, the European Union, Japan, Mexico, South Africa, United States, and Venezuela. Data collected by AFEAS for 1996 represent a fraction of global CFC production, informally estimated to be less than 35%. Global coverage for previous years is estimated to be as follows: 1982, 87%; 1983, 86%; 1984, 85%; 1985, 83%; 1986, 82%; 1987, 80%; 1988, 79%; 1989, 78%; 1990, 70%; 1991, 70%; 1992, 75%; 1993, <75%; 1994, <60%, and 1995, <50%. For years prior to 1982, global coverage is assumed to be 100%. Atmospheric release of CFCs is calculated using data compiled by Grant Thornton LLP and assumptions about the rate of release from end-use applications.

**Table 11.4 Global Atmospheric Concentrations of Greenhouse and Ozone-depleting Gases, 1970-1997**

Year	Carbon		Methyl chloro- form	CFC- 11 (CCl <sub>3</sub> F)	CFC- 12 ppt	CFC- 113 ppt	Total chlorine (gas) ppt	Nitrous oxide (N <sub>2</sub> O) ppb	Meth- ane (CH <sub>4</sub> ) ppb
	Carbon dioxide (CO <sub>2</sub> ) ppm	tetra- chloride (CCl <sub>4</sub> ) ppt							
1970	325.5	na	na	na	na	na	na	na	na
1971	326.2	na	na	na	na	na	na	na	na
1972	327.3	na	na	na	na	na	na	na	na
1973	329.5	na	na	na	na	na	na	na	na
1974	330.1	na	na	na	na	na	na	na	na
1975	331.0	na	na	na	na	na	na	na	na
1976	332.0	na	na	na	na	na	na	na	na
1977	333.7	na	na	na	na	na	na	na	na
1978	335.3	88	58	139	257	na	1,457	298	na
1979	336.7	88	63	147	272	na	1,529	299	na
1980	338.5	90	71	158	289	na	1,622	299	na
1981	339.8	91	76	166	305	na	1,698	299	na
1982	341.0	93	82	175	325	26	1,871	301	na
1983	342.6	94	86	182	341	28	1,945	302	na
1984	344.3	95	89	190	355	31	2,024	303	na
1985	345.7	97	93	200	376	36	2,127	304	na
1986	347.0	98	97	209	394	40	2,222	305	1,600
1987	348.8	100	100	219	411	48	2,321	306	1,611
1988	351.3	101	104	231	433	53	2,432	306	1,619
1989	352.8	101	108	240	452	59	2,531	306	1,641
1990	354.0	102	111	249	469	66	2,626	307	1,645
1991	355.5	102	114	254	483	71	2,691	307	1,657
1992	356.3	101	118	260	496	77	2,762	308	1,673
1993	357.0	101	112	262	508	81	2,768	308	1,678
1994	358.9	92	106	262	512	81	2,774	309	1,673
1995	360.9	99	97	261	519	82	na	309	1,681
1996	362.7	98	85	261	524	82	na	310	1,683
1997	363.8	97	73	260	528	83	na	311	1,690

**Sources:** Carbon dioxide: Keeling, C.D. and T.P. Whorf, Scripps Institution of Oceanography, *Atmospheric CO<sub>2</sub> Concentrations Derived From In Situ Air Samples Collected at Mauna Loa Observatory, Hawaii, 1958-1998* (an Internet accessible numerical database) (Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, Oak Ridge, TN, 1998).

Trace gases: Prinn, R.G., et al., *Continuous High Frequency Gas Chromatographic Measurements of CH<sub>4</sub>, N<sub>2</sub>O, CFC-11, CFC-12, CFC-113, Methyl Chloroform, and Carbon Tetrachloride From the ALE/GAGE/AGAGE Network Station at Cape Grim, Tasmania* (an Internet accessible numerical database) (Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, Oak Ridge, TN, 1998).

**Notes:** ppm = parts per million. ppb = parts per billion. ppt = parts per trillion. CFC = Chlorofluorocarbon. All estimates are by volume.

**Table 11.5 Global and Regional Surface Temperature Anomalies, 1960-1996**

	Global	North.	South.	Trop- ical	South Polar	South	S. Sub-	Equator	N. Sub-	North	North
		Hemi- sphere	Hemi- sphere			Tem- perate	trop- ical		trop- ical	Polar	
..... <i>degrees Centigrade</i> .....											
1960	0.00	-0.11	0.11	0.05	-0.85	0.52	0.23	0.02	-0.09	-0.15	-0.19
1961	0.24	0.24	0.28	0.00	0.24	0.57	0.10	0.11	-0.22	0.55	0.67
1962	0.12	0.13	0.13	-0.05	-0.66	0.68	0.09	-0.11	-0.11	0.23	0.60
1963	0.09	0.16	0.01	0.04	-0.23	0.27	-0.10	-0.04	0.26	0.29	-0.09
1964	-0.24	-0.31	-0.18	-0.23	-0.52	-0.09	-0.08	-0.21	-0.40	-0.27	-0.30
1965	-0.17	-0.24	-0.10	-0.20	-0.43	0.20	-0.18	-0.22	-0.20	-0.40	0.02
1966	-0.05	-0.22	0.11	-0.06	0.60	0.20	-0.19	0.05	-0.03	0.09	-1.45
1967	0.04	0.06	0.01	-0.13	0.39	-0.11	0.03	-0.15	-0.26	0.38	0.30
1968	-0.10	-0.07	-0.13	-0.18	-0.28	0.11	-0.34	-0.04	-0.16	0.05	-0.15
1969	-0.14	-0.14	-0.14	0.23	0.12	-0.68	0.10	0.21	0.37	-0.83	-0.15
1970	-0.05	0.09	-0.19	0.05	0.06	-0.47	-0.11	0.01	0.26	-0.08	0.17
1971	-0.22	-0.16	-0.28	-0.21	0.10	-0.55	-0.20	-0.29	-0.15	-0.16	-0.05
1972	-0.19	-0.20	-0.19	-0.01	0.20	-0.62	-0.05	0.02	0.02	-0.45	-0.34
1973	0.19	0.25	0.13	0.40	0.53	-0.48	0.40	0.37	0.43	-0.13	0.50
1974	-0.03	-0.06	0.01	-0.03	1.01	-0.37	-0.13	0.03	0.01	-0.26	0.15
1975	0.07	0.16	-0.02	0.00	1.09	-0.52	-0.07	-0.01	0.08	0.40	0.01
1976	-0.24	-0.15	-0.33	-0.11	-0.27	-0.49	-0.34	-0.09	0.10	-0.41	-0.20
1977	0.16	0.12	0.20	0.31	0.70	-0.14	0.23	0.28	0.41	-0.09	-0.24
1978	0.10	0.16	0.06	0.24	-0.14	0.03	0.01	0.37	0.34	-0.14	0.15
1979	0.18	0.12	0.23	0.29	0.43	0.16	0.01	0.57	0.29	-0.01	-0.45
1980	0.38	0.31	0.46	0.53	0.97	0.12	0.61	0.32	0.67	0.02	0.15
1981	0.42	0.58	0.26	0.30	0.96	0.07	0.13	0.20	0.57	0.71	0.75
1982	0.20	0.16	0.25	0.43	-0.07	0.07	0.54	0.37	0.37	0.06	-0.29
1983	0.43	0.53	0.34	0.43	0.97	-0.36	0.65	0.46	0.18	1.11	0.12
1984	0.29	0.25	0.34	0.33	0.93	-0.21	0.69	0.11	0.19	0.28	0.44
1985	0.02	-0.21	0.25	0.18	0.53	0.16	0.21	0.24	0.10	-0.69	-0.31
1986	0.14	0.13	0.16	0.26	0.45	-0.17	0.26	0.31	0.21	-0.05	0.13
1987	0.46	0.30	0.61	0.92	0.42	0.10	0.96	1.12	0.68	-0.01	-0.63
1988	0.37	0.41	0.33	0.45	1.37	-0.46	0.44	0.65	0.26	0.45	0.40
1989	0.24	0.48	-0.01	0.15	-0.29	-0.14	0.11	0.28	0.07	0.73	1.02
1990	0.56	0.76	0.36	0.50	0.57	0.01	0.38	0.79	0.33	1.04	1.04
1991	0.48	0.46	0.51	0.55	1.25	-0.03	0.62	0.59	0.44	0.33	0.64
1992	0.14	0.08	0.20	0.40	0.76	-0.69	0.84	0.15	0.22	0.05	-0.23
1993	0.16	0.30	0.02	0.33	-0.09	-0.42	0.35	0.32	0.32	-0.14	1.10
1994	0.35	0.54	0.15	0.55	-0.42	-0.10	0.42	0.65	0.59	0.54	0.36
1995	0.64	0.98	0.28	0.76	0.17	-0.40	0.85	0.64	0.78	1.13	1.45
1996	0.46	0.49	0.42	0.67	1.54	-0.32	0.62	0.35	1.05	-0.16	0.84

**Source:** Angell, J.K. NOAA Air Resources Laboratory, *Annual and Seasonal Global Temperature Anomalies in the Troposphere and Low Stratosphere, 1958-1996* (Carbon Dioxide Information Analysis Center, Oak Ridge, TN, 1997).

**Notes:** Estimates are calculated relative to a 1958-1977 reference period mean. Zonal regions are defined as follows: Northern Hemisphere (equator - 90 N); Southern Hemisphere (equator - 90 S); Tropical (30 S - 30 N); South Polar (90 S - 60 S); South Temperate (60 S - 30 S); South Subtropical (30 S - 10 S); Equator (10 N - 10 S); North Subtropical (10 N - 30 N); North Temperate (30 N - 60 N); and North Polar (60 N - 90 N).

**Table 11.6 Annual Average Global Temperature, 1866-1997**

Year	°C	°F									
1866	13.93	57.07	1899	13.84	56.91	1932	14.00	57.20	1965	13.85	56.93
1867	13.92	57.06	1900	14.00	57.20	1933	13.87	56.97	1966	13.93	57.07
1868	13.75	56.75	1901	13.96	57.13	1934	14.03	57.25	1967	13.98	57.16
1869	14.03	57.25	1902	13.77	56.79	1935	13.90	57.02	1968	13.90	57.02
1870	13.89	57.00	1903	13.67	56.61	1936	14.01	57.22	1969	14.00	57.20
1871	13.85	56.93	1904	13.57	56.43	1937	14.12	57.42	1970	14.04	57.27
1872	13.95	57.11	1905	13.76	56.77	1938	14.16	57.49	1971	13.89	57.00
1873	13.76	56.77	1906	13.88	56.98	1939	13.98	57.16	1972	13.95	57.11
1874	13.89	57.00	1907	13.61	56.50	1940	14.15	57.47	1973	14.18	57.52
1875	13.86	56.95	1908	13.75	56.75	1941	14.12	57.42	1974	13.94	57.09
1876	13.89	57.00	1909	13.71	56.68	1942	14.11	57.40	1975	13.97	57.15
1877	14.13	57.43	1910	13.79	56.82	1943	14.04	57.27	1976	13.77	56.79
1878	14.17	57.51	1911	13.74	56.73	1944	14.10	57.38	1977	14.15	57.47
1879	13.74	56.73	1912	13.72	56.70	1945	13.99	57.18	1978	14.06	57.31
1880	13.84	56.91	1913	13.76	56.77	1946	14.01	57.22	1979	14.12	57.42
1881	13.87	56.97	1914	14.00	57.20	1947	14.13	57.43	1980	14.26	57.67
1882	13.89	57.00	1915	14.05	57.29	1948	13.98	57.16	1981	14.39	57.90
1883	13.85	56.93	1916	13.79	56.82	1949	13.91	57.04	1982	14.08	57.34
1884	13.57	56.43	1917	13.59	56.46	1950	13.85	56.93	1983	14.34	57.81
1885	13.70	56.66	1918	13.69	56.64	1951	13.98	57.16	1984	14.15	57.47
1886	13.67	56.61	1919	13.93	57.07	1952	14.05	57.29	1985	14.13	57.43
1887	13.50	56.30	1920	13.87	56.97	1953	14.14	57.45	1986	14.17	57.51
1888	13.76	56.77	1921	13.95	57.11	1954	13.93	57.07	1987	14.34	57.81
1889	14.04	57.27	1922	13.91	57.04	1955	13.92	57.06	1988	14.42	57.96
1890	13.68	56.62	1923	13.86	56.95	1956	13.84	56.91	1989	14.28	57.70
1891	13.52	56.34	1924	13.89	57.00	1957	14.09	57.36	1990	14.49	58.08
1892	13.62	56.52	1925	13.85	56.93	1958	14.10	57.38	1991	14.43	57.97
1893	13.60	56.48	1926	14.07	57.33	1959	14.04	57.27	1992	14.14	57.45
1894	13.65	56.57	1927	13.95	57.11	1960	13.98	57.16	1993	14.16	57.49
1895	13.68	56.62	1928	14.00	57.20	1961	14.09	57.36	1994	14.29	57.72
1896	13.77	56.79	1929	13.79	56.82	1962	14.05	57.29	1995	14.43	57.97
1897	13.85	56.93	1930	13.96	57.13	1963	14.04	57.27	1996	14.32	57.78
1898	13.78	56.80	1931	14.02	57.24	1964	13.75	56.75	1997	14.36	57.85

**Source:** Hansen, J. et al., Goddard Institute for Space Studies, Table of Global-mean Monthly, Annual, and Seasonal dTs Based on Met.station Data, 1866-present (an Internet accessible data file).

**Notes:** °C = degrees Centigrade. °F = degrees Fahrenheit. Data are derived from global temperature anomalies in 0.01 degrees Centigrade based on a 1951-1980 reference period mean. Data were checked and adjusted for urban warming.